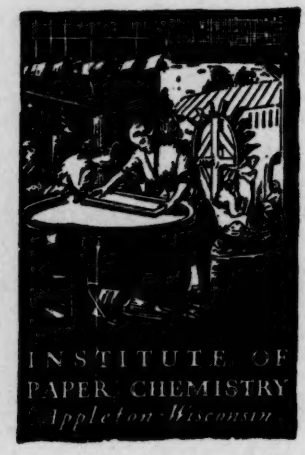
PAGES 647-722

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH
LAWRENCE COLLEGE
APPLETON, WISCONSIN

LIBRARY NOTES

MAY • 1952
Volume 22 Number 9

THE cut on the cover is a reproduction of the Bookplate of The Institute of Paper Chemistry. The drawing, entitled, "the Papermaker," first appeared in 1698 in the Book of Trade by Christoff Weigel. This particular reproduction has been copied from an illustration appearing on page 43 of Dard Hunter's book "Papermaking Through Eighteen Centuries," published in New York in 1930 by William Edwin Rudge. THE INSTITUTE is greatly indebted to Mr. Hunter for permission to use the illustration.

BULLETIN

of

THE INSTITUTE of PAPER CHEMISTRY

AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

MAY · 1952

Volume 22 Number 9

LIBRARY NOTES

The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter November 13, 1930, at the postoffice at Appleton, Wis., under the act of August 24, 1912. Printed in U.S.A.

THE INSTITUTE OF PAPER CHEMISTRY

OFFICERS

ERNST MAHLER	Chairman of the Board
D. C. EVEREST	Vice-Chairman of the Board
JOHN L. RIEGEL	Vice-Chairman of the Board
WESTBROOK STEELE	President
JOHN G. STRANGE	Vice-President—Treasurer
C. B. SITTERSON, JR.	Secretary
DORIS PICKERT	Assistant Secretary

BOARD OF TRUSTEES

NATHAN M. PUSEY, President of Lawrence College, ex officio
WESTBROOK STEELE, President of The Institute of Paper Chemistry, ex officio

For the term expiring in 1952

D. C. EVEREST, Marathon Corporation, Rothschild, Wis.
DAVID L. LUKE, JR., West Virginia Pulp and Paper Company, New York, N.Y.
HERBERT T. RANDALL, The Champion Paper and Fibre Company, Hamilton, Ohio.
JOHN L. RIEGEL, Riegel Paper Corporation, New York, N.Y.
GEORGE OLMSTED, JR., S. D. Warren Company, Boston, Mass.
KARL E. STANSBURY, Thilmany Pulp and Paper Company, Kaukauna, Wis.

For the term expiring in 1953

DAN K. BROWN, Neenah Paper Company, Neenah, Wis.
GEORGE E. DYKE, Robert Gair Company, New York, N.Y.
STUART E. KAY, International Paper Company, New York, N.Y.
A. B. LAYTON, Crown Zellerbach Corporation, San Francisco, Calif.

For the term expiring in 1954

SYDNEY FERGUSON, The Mead Corporation, Dayton, Ohio.
DONALD S. LESLIE, Hammermill Paper Company, Erie, Pa.
ERNST MAHLER, Kimberly-Clark Corporation, Neenah, Wis.
W. IRVING OSBORNE, JR., Cornell Paperboard Products Company, Chicago, Ill.

STANDING COMMITTEES OF THE TRUSTEES

EXECUTIVE COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, George E. Dyke, David L. Luke, Jr., and Karl E. Stansbury.
INVESTMENT COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, John G. Strange, and Ralph J. Watts.
COMMITTEE ON ACADEMIC POLICY: Nathan M. Pusey, Chairman; Rex Hovey, Harry F. Lewis, Ernst Mahler, John L. Riegel, Westbrook Steele, and John G. Strange.

Books and Pamphlets Added to the Library During April

AIR POLLUTION

UNITED STATES TECHNICAL CONFERENCE ON AIR POLLUTION. Air pollution, proceedings. Sponsored by the Interdepartmental Committee on Air Pollution. Louis C. McCabe, chairman. New York, McGraw-Hill Book Co., 1952. 847 p.

CHROMATOGRAPHY

CRAMER, FRIEDRICH. Papierchromatographie. Weinheim, Verlag Chemie, 1952. 81 p.

COLOR

JUDD, DEANE B. Color in business, science, and industry. New York, Wiley [c1952] 401 p.

ELECTROCHEMISTRY

BUTLER, J. A. V., ed. Electrical phenomena at interfaces in chemistry, physics and biology. New York, Macmillan, 1951. 309 p.

ENGLISH LANGUAGE

The NEW CENTURY dictionary of the English language, based on matter selected from the original Century Dictionary and entirely rewritten, with the addition of a great amount of new material, and containing the great mass of words and phrases in ordinary use. 12,000 quotations. 4,000 pictorial illustrations. Ed. by H. G. Emery and K. G. Brewster; revision editor, Catherine B. Avery. . . New York, Appleton-Century-Crofts [c1952] 2 v. 2820 p.

FOREST PRODUCTS—MARKETING

NORTHEASTERN WOOD UTILIZATION COUNCIL. Connwood, Incorporated, an experiment in cooperative marketing. Bulletin no. 34. New Haven, The Council, 1951. 16 p.

NORTHEASTERN WOOD UTILIZATION COUNCIL. Marketing sawdust and chipped wood. Bulletin 38. New Haven, The Council, 1952. 24 p.

ISOTOPES

CALVIN, MELVIN, HEIDELBERGER, CHARLES, REID, JAMES C., TOLBERT, BERT M., and YANKWICH, PETER E. Isotopic carbon; techniques in its measurement and chemical manipulation. New York, Wiley, 1949. 376 p.

PAPER MAKING AND TRADE

AMERICAN PAPER AND PULP ASSOCIATION. The statistics of

paper. 3d ed. New York, The Association [c1951] 68 p.

PHOTOGRAPHY

MCKAY, HERBERT C. Three-dimensional photography; principles of stereoscopy. Minneapolis, American Photography, Book Department [c1951] 334 p.

PRINTING

The PENROSE ANNUAL 1952, a review of the graphic arts. Ed. by R. B. Fishenden. New York and London, Pitman Publ. Corp. [c1952] v. 46. 150 p. + numerous illustrations.

TANNING

ORTHMANN, AUGUST C. Tanning processes. Hide and Leather Publ. Co., 1945. 414 p.

THOUGHT AND THINKING

KEYES, KENNETH S., JR. How to develop your thinking ability. New York, McGraw-Hill Book Co. [c1950] 246 p.

WASPS

REAUMUR [Rene-Antoine-Ferchault de] Histoire des guespes. Memoires de l'Academie royale des sciences. [Paris, Imprimerie Royale, 1721] p. 230-277 + 7 fold. plates.

WATER-MARKS

The BRIQUET ALBUM, a miscellany on watermarks, supplementing Dr. Briquet's *Les filigranes*, by various paper scholars. Monumenta chartae papyraceae historiam illustrantia, or collection of works and documents illustrating the history of paper. II. General editor: E. J. Labarre. Hilversum, Holland, The Paper Publications Society, 1952. 158 p.

WOOD

FOREST PRODUCTS RESEARCH SOCIETY. Proceedings of the national annual meeting. Convention Hall, Philadelphia, Pennsylvania, Monday, Tuesday, Wednesday, Thursday and Friday, May 7, 8, 9, 10 and 11, 1951. Madison, The Society, c1951. v. 5. 400 p.

WOOD-PULP

U. S. CONGRESS. HOUSE. *Committee on the Judiciary. Subcommittee on Study of Monopoly Power.* Pulp. Part 2. Report of the Subcommittee . . . pursuant to H. Res. 95 (82d Cong., 1st Sess.) submitted by Mr. [Emanuel] Celler. Washington, U. S. Govt. Print. Off., 1952. 53 p.

WOOD WASTE

ALLISON, F. E., and ANDERSON, M. S. The use of sawdust for mulches and soil improvement. U. S. Dept. of Agriculture. Circular no. 891. Washington [U. S. Govt. Print. Off., 1952] 19 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

DAY, FREDERICK T. Paper conversion and usage. No. 26. Adhesives used by the paper converter, the printer and allied trades. World's Paper Trade Rev. 137, no. 9: 599-600, 602 (Feb. 28, 1952); *cf.* B.I.P.C. 22: 512-13.

The different types of adhesives used by printers (make-ready paste, strip gum, bookbinding paste, padding glues, heat-sealing adhesives, and those for general labeling work) are discussed briefly, and directions on storage and handling are given. 2 illustrations. E.S.

ADHESIVES—TESTING

CURRIER, HAROLD N. Quality control system for envelope manufacturers. Am. Paper Converter 26, no. 4: 10-11, 66, 68, 70 (April, 1952); *cf.* B.I.P.C. 22: 313.

The author describes a system of testing and quality control in the manufacture of envelopes in which the gumming qualities and resistance to adhesion of incoming paper are pretested and controls are set up so that the proper gum for every type of paper and machine can be specified in advance and rechecked when run. 4 figures. M.W.

VAN DEN AKKER, J. A. Instrumentation studies. LXIX. General discussion of the measurement of adhesion and cohesion. Tappi 35, no. 4: 155-62A (April, 1952); *cf.* B.I.P.C. 22: 605-6.

Following a review of existing methods for evaluating adhesion and bonding strength, this report presents a critical consideration of the stresses involved in the measurement of strength of bond in tension, compression, shear, torsion, and special tests. The manner in which various factors can result in stress intensification and failure at spuriously low apparent stress is described in some detail. Suggestions for the improvement of instrumentation of adhesion measurement are given. In conclusion, a section on the influence of factors relative to use requirements is included. 9 figures and 22 references. E.S.

ALKALINE PROCESSES—RECOVERY

TOMLINSON, G. H., II, and DOUGLAS, H. R. A progress report on the secondary recovery of heat and chemicals in the alkaline pulp mill. Pulp Paper Mag. Can. 53, no. 4: 96-104 (March, 1952); *cf.* B.I.P.C. 17: 109-10.

Although still in the development stage, the operation of the integrated recovery system used at the Cornwall and Windsor mills of Howard Smith Paper Mills Limited is described, involving black-liquor oxidation, spray

towers, cyclonic evaporators, deluge and condensing towers, and a new induced-draft fan for improving the supply of the combustion air. A Bergström-Trobeck oxidation tower which can be used without supplementary processing of the flue gas is on order. The advantages and economics of the process are discussed in detail; data on the performance of certain pieces of equipment and on the effect of integrated secondary recovery on the sulfur balance in the mill are included. Calculations and equations relating operating variables to the efficiency of the operation of the recovery unit and the effect of black-liquor oxidation to subsequent recovery-unit reactions and their effect on liberated heat are appended. 2 tables, 3 figures, and 5 references.
E.S.

ASBESTOS

WILLIAMS, A. E. Sprayed asbestos; an innovation in paper mills. World's Paper Trade Rev. 137, no. 10: 696, 698, 703-4 (March 6, 1952).

The application of sprayed asbestos coatings for preventing condensation in paper mills, as heat insulation, and as a fireproofing agent is described. 2 tables and 2 illustrations. **E.S.**

BARKERS AND BARKING

BELL, G. E., and MARTIN, P. E. Bark removal methods and machines. Canada. Department of Resources and Development. Forestry Branch. Forest Products Laboratories Division. Mimeograph 0-162: 15 p. (September, 1951).

The types of machines presently available for bark removal are described and illustrated. 20 illustrations. M.W.

BIRCH

JENSEN, WALDEMAR, and RAINIO, PENTTI. Birch as a raw material in pulp manufacture. IV. The chain-length distribution of carbohydrates in birch sulfite pulp as compared with spruce sulfite pulp. Paper and Timber (Finland) 34, no. 3: 53-6 (March, 1952). [In Swedish; English summary] *cf.* B.I.P.C. 22: 316.

A comparison of the molecular chain-length distribution of birch (F-J) and spruce (A-E) laboratory and commercial dissolving pulps is described. The pulps were subjected to nitration and the nitrates fractionally precipitated from their acetone solutions by the successive addition of ligroin (boiling point 92-105°C.). The D.P. values were determined for each fraction by measuring their viscosities in acetone solution with an Ubbelohde viscometer. From these values the distribution curves were calculated. The distribution curves for the commercial spruce dissolving pulps A and B were used as a basis for comparing the curves obtained with the other pulps. The pulps prepared on a laboratory scale were cooked in a 10-liter rotary autoclave. The cooking method used for producing the unbleached spruce sulfite pulp C conformed as closely as possible to that by which A and B had been prepared; its distribution curve resembled that of A to a certain extent. The other laboratory cooks were made according to the following schedule: 4 liters of cooking liquor/kg. airdry wood; 5% sulfur dioxide; 1% calcium oxide; penetration overnight; temperature increased to 135°C. during 0.5 hour; and cooking at this temperature until the digestion was complete. The cooking periods at the maximum temperature were: 8 hours for D, 8.25 hours for F, 8.33 hours

for G, and 8.5 hours for H. The curve for D indicates that this pulp is more polydisperse than C, because the cooking method of the former differs from the industrial method used for C by a lower sulfur dioxide content, a more rapid rise to maximum temperature, longer cooking time at this maximum, and a shorter total cooking period. The curve for pulp E illustrates the effect of bleaching (chlorination, alkali wash, chlorination, alkali wash, hypochlorite treatment) on pulp D. Pulp E, although more polydisperse, is similar to pulp B. A comparison of the birch pulps F, G, and H shows the change in these sulfite pulps with decreasing D.P. The curve for I shows the effect of bleaching on G. The spruce pulp D and the birch pulp G were both cooked by the same method and have the same average D.P.; these as well as the corresponding bleached pulps E and I show marked similarities. The same applies also to the commercial, bleached pulps B (spruce) and J (birch). The greater polydispersity of J results from the fact that it was cooked and bleached as a paper pulp, whereas B is a dissolving pulp. The conclusions drawn by the authors from the present study are that the chain-length distributions show the same general features in the case of both birch and spruce pulps of the dissolving type. With regard to its chain-length distribution, birch pulp might be used for dissolving purposes. The difficulties which arise in this manufacture are primarily of a chemical nature. 4 tables, 1 figure, and 9 references. E.S.

BOARD

ELMENDORF, ARMIN. New fiber boards made with non-critical binders. Proc. Forest Products Research Soc. 5: 155-61; discussion: 161 (1951).

A survey is presented of native and foreign boards which are made with noncritical binders. The various forms in which wood or wood waste may be used, the processes or means for mixing the binders and forming the boards, and the resultant properties of the products are considered. Of the group which includes sawdust-concrete, cement-bonded shavings, and similar products, improved excelsior fiberboards which are bonded with inorganic materials exhibit properties that merit further development. 6 tables and 7 references. M.W.

SCHWARTZ, S. L., and BAIRD, P. K. Suitability of sand hickory for insulating board and hardboard. Southern Pulp Paper Manuf. 15, no. 4: 68, 70, 72-4 (April, 1952).

Hickory is a tree of wide range, growing in every state east of the Mississippi River and in several states on the western side. Its high-quality wood, which is strong, stiff, and tough, is much in demand for the manufacture of tool handles. In recent years, however, it has become increasingly difficult to secure large quantities of high-quality hickory from any one region. Most of the total supply of hickory is unsuitable for use in tool handles because of the low density, cross grain, or other defects. In many cases, only one high-quality log can be cut from a tree, and the rest of the wood must be used for fuel or discarded. Substantial quantities of low-quality hickory, however, are found in woodlots of the southern parts of the country. Finding uses for this low-quality wood has taken on economic importance in order to provide the high-quality wood for tool handles and other products in which its special strength qualities are valuable. In line with this objective, sand hickory of poor quality was investigated for possible use in making insulating board and hardboards. This report presents data on: (1) experimental insulating board from attrition-milled, water-soaked, steamed, or steam-cooked sand hickory chips, and (2) sand hickory hardboard pre-

pared from stocks produced in a laboratory-model Asplund Defibrator. From the experimental data obtained, it has been shown that acceptable stocks for making sheathing-grade insulating boards can be prepared from sand hickory chips steam cooked at high temperature and attrition milled. Acceptable hardboard stocks can be prepared by the Asplund Defibrator process. The preparation of hardboard stocks from attrition-milled, steam-cooked sand hickory chips appears to be feasible. Stocks prepared from water-soaked and from mildly steamed sand hickory chips by attrition milling were unsatisfactory for the preparation of strong insulating boards and strong hardboards. 4 tables, 3 figures, and 8 references. E.S.

BOARD—CONVERSION

BOXBOARD CONTAINERS. Folding paper box finishing operations. Article 5—Greaseproofing by lamination. Boxboard Containers 70, no. 712: 51, 53 (April, 1952); *cf.* B.I.P.C. 22: 562.

The basic material of greaseproof laminates is chipboard, and lining materials include white stocks and natural krafts, opaque glassine, and various other "lard packs". Adhesives are of three types: starch, moisture-barrier and microcrystalline wax adhesive, and asphalt. Typical laminating techniques are described in which asphalt and wax are used. 3 figures. M.W.

BOARD, CORRUGATED

BOYCE, E. G. Replies to silicate questionnaire and remarks on use. Fibre Containers 37, no. 4: 82, 87 (April, 1952).

The 20 replies to a questionnaire on the use of sodium silicate which was circulated among manufacturers of corrugated containers by the Corrugated Containers Committee of TAPPI are summarized under the three headings: adhesive, machine operation, and board characteristics. M.W.

GANTT, E. S. Two-starch system for corrugating. Fibre Containers 37, no. 4: 74, 79 (April, 1952).

The reasons for employing a two-starch system (one to apply a thin paste to the single facer and the other to provide a heavier paste for the double backer) are presented. In the opinion of the author the expense and trouble of such a system would be too great to warrant its use under normal circumstances. Changes in machine design, insulation, and better air circulation will help to overcome the one-mix system difficulties at the single facer. 1 figure. M.W.

LANDER, J. G. Silicate composition effects on corrugator performance. Fibre Containers 37, no. 4: 80, 108-9 (April, 1952).

The rate of set and temperature viscosity change are the limiting factors which govern the silicate of soda ratio range for corrugated use from 1 part of sodium oxide and 3.22 parts of silica to 1 part of sodium oxide and 3.40 parts of silica. The optimum ratio and the specific gravity at which the ratio will produce the desired results must be determined for a specific application. 1 figure and 2 references. M.W.

NITCHIE, CHARLES D. Clearances on the corrugator. Fibre Containers 37, no. 4: 71-2 (April, 1952).

The author discusses the maintenance of intelligent adjustment of the adhe-

sive mechanism to achieve adequate bonding of the single face without distortion of the accurately formed flutes. 1 figure. M.W.

BOARD SPECIALTIES

ANON. Book matches. Am. Pressman 62, no. 5: 22, 24 (April, 1952).

The history of matches is briefly sketched, and the development of book matches to their present status as one of the most important and widely used forms of advertising media is traced. M.W.

BOARD TESTING—PHYSICAL

FICKLER, HANS-HEINRICH. The status of development of testing specifications for the properties of wood fiberboard. Svensk Papperstidn. 55, no. 5: 153-72 (March 15, 1952). [In German; English and Swedish summaries]

This is an extensive review of the testing methods developed in different countries of the world for the evaluation of the properties of wood fiberboards for the purpose of an eventual international standardization. The procedures have been arranged and are discussed under the subdivisions physical (specific gravity and thickness; moisture and conditioning; water absorption, swelling, and linear expansion; heat conductivity; acoustical insulating properties; and water permeability), elastic and strength (modulus of elasticity; tensile strength in the direction of the board and perpendicular to it; crushing and breaking strength; bending strength; compressibility; impact bending strength; and hardness), and performance methods (nail-holding power; resistance to nail penetration; wear; resistance to fire, insects, fungi, and chemicals; and accelerated aging). Different methods for examining one specific property are classified under one heading. The first step to co-ordinate the scattered efforts in this field on an international basis was taken in 1947 by the Food and Agriculture Organization of the United Nations. Under its auspices international conferences were held in Washington, Geneva, and Igls (Austria), with J. Markwardt as chairman of the subcommittee in charge of the field work. Finally, an international agreement on a considerable number of testing methods was reached at the last conference in Igls in 1951. A list of U. S., Scandinavian (Swedish, Norwegian, and Finnish), German and Austrian, English, and French standards is appended. 2 tables, 7 figures, and 13 references. E.S.

PRINTING, PACKAGING AND ALLIED TRADES RESEARCH ASSOCIATION. Initial tear tester for boards. World's Paper Trade Rev. 137, no. 11: 788 (March 13, 1952).

An adaptation of a machine for determining the tensile strength of steel is described which will permit the measurement of the initial tearing strength of boards up to a maximum load of two tons; this is an important property of materials used for boxes which are intended for frequent handling and long service. The initial tear as measured by this instrument is not a fundamental characteristic of the board; although probably related to tensile strength, it is not a simple relationship, and the two tests do not grade boards in the same order. 1 figure. E.S.

BREAK-EVEN CHART

ELLIOTT, NORMAN J. A case history—and expense and profit

study of a corrugated container plant. Boxboard Containers 70, no. 712: 36, 38 (April, 1952).

A profitgraph, or break-even chart, is presented and interpreted. 2 tables and 1 graph. M.W.

CASTOR OIL PLANT

BHAT, R. V., and JASPAL, NARENDRA S. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part II. Pulps for writing and printing papers from the castor oil plant (*Ricinus communis*). Indian Forester 77, no. 7: 450-63 (1951); *cf.* B.I.P.C. 22: 277.

The pulping properties of both the annual type of castor oil plant and the perennial tree variety were tested by the sulfate and soda processes. Easy bleaching pulps with satisfactory strength properties can be prepared by either process, although the sulfate process seems to be more suitable. The stems of both varieties of plants can be used without the removal of the bark. The pulps from the bark are long-fibered, whereas those from the wood are short-fibered and may have to be mixed with bamboo or sabai grass pulps for the production of writing and printing papers. 7 tables and 12 references. M.W.

CELLOPHANE

E. I. DU PONT DE NEMOURS & COMPANY, INC. A dozen ways to make cellophane work better. Am. Pressman 62, no. 5: 19-20 (April, 1952).

Some suggestions are presented on the care and handling of cellophane to insure maximum performance in strength and appearance. M.W.

CELLULOSE

HOCK, CHARLES W. The fibrillate structure of natural cellulose. J. Polymer Sci. 8, no. 4: 425-34 (April, 1952).

Interpretations of the small-scale structure of natural cellulose have been greatly influenced by information obtained from x-ray diffraction studies. This work has given rise to a structural model, according to which there are some regions of cellulose in which the molecules are highly ordered (crystalline) and other regions in which there is considerable disorder (amorphous). This interpretation does not, however, adequately emphasize the fibrillate character of natural cellulose—a structure which, as the result of light and electron microscope investigations is well established. Since many reactions proceed more readily in the interfibrillar regions than in the fibrils themselves, it seems that the cellulose molecules in the fibrils, in contrast to those in the interfibrillar regions, are more highly ordered. Intensive treatments, such as acid hydrolysis, may cause a further breakdown whereby the fibrils are split transversely into small rod-shaped particles, but the comparatively greater ease with which fibrillation occurs following a variety of degradative reactions suggests that the ordered character of the fibrils along the long axis is not interrupted by regions of the same magnitude and extent of disorder as those which occur between the fibrils. Although x-ray diffraction diagrams of cellulose have generally been considered to indicate the presence of small elongated regions of highly crystalline cellulose, i.e., micelles, it would be equally consistent to suppose that the diffuse diffraction patterns were caused by larger essentially homogeneous regions in which the arrange-

ment of the molecules only approximates crystalline regularity. These regions which, except for occasional grosser irregularities have a more or less uniform intermediate molecular order, may be identified with the fine electron microscopically visible fibrils. According to this viewpoint, highly ordered micelles, unlike fibrils, are to be regarded more as incidental rather than as fundamental units of cellulose structure. 49 references. E.S.

RÅNBY, BENGT G. Fine structure and reactions of native cellulose. Inaugural Dissertation, University of Uppsala. Stockholm, Grafiska Konstanstalten Tryckeri AB, 1952. 22 p.

A study of native cellulose by means of electron, microscopic, x-ray, and viscosity measurements is presented. Most of the samples were wood and cotton, but bacterial, animal, and algal celluloses were also included. Native cellulose is broken up by ultrasonic irradiation into fibrils about 100 A. in diameter and of indefinite length. The degree of order (as indicated by the sharpness of the x-ray pattern and resistance to swelling in alkalies and water sorption) increases in the order: wood, cotton, and bacterial and animal cellulose. Hydrolysis of wood and cotton celluloses gives fragments ranging from 200 to 1000 A. with a weight average of 500 A., in general agreement with the measured "limiting D.P." of 100-150. Bacterial and animal cellulose give longer fragments. These particles may be peptized to form colloidal aqueous sols. Wood celluloses have higher polymolecularity than cotton and so do the corresponding hydrocelluloses. There was no direct evidence of periodicity. The author attributes accessibility and noncrystallinity (by x-ray methods) to imperfections in crystallinity rather than to regions of very low order, as far as native cellulose is concerned, but not necessarily for mercerized or regenerated celluloses. 6 tables, 24 figures, and 80 references.
K.W., JR.

CELLULOSE—OXYCELLULOSE

KONOW, RUBEN VON. Oxidants that promote the dialdehyde cleavage of glycols, starch, and cellulose. Tappi 35, no. 4: 64A, 66A (April, 1952).

With reference to the paper by Heidt, Gladding, and Purves published under this title (*cf.* B.I.P.C. 16: 53), the author offers a new explanation of the oxidation mechanism suggested by the previous authors. A letter from Purves to Heidt in this matter is appended. 3 figures. E.S.

CELLULOSE ETHERS

JULLANDER, INGVAR. Physico-chemical properties of ethyl-hydroxyethyl cellulose. Svensk Papperstidn. 55, no. 6: 197-211 (March 31, 1952). [In English; German and Swedish summaries]

Different physicochemical properties of water-soluble ethylhydroxyethylcellulose (trade name Modocoll) in solid form and solution have been investigated. The results are compared with similar information available in literature for analogous types of cellulose ethers, of which the methyl- and carboxymethylcelluloses are the most important. An analytical method for determining the ethoxyl and hydroxyethyl contents is described; the degree of substitution of both groups together is 1.8-2.0 for the products investigated. The hygroscopicity is low, the same as for the cellulose itself or slightly higher. The structure of the solutions is discussed at length. Sedimentation experiments in an ultracentrifuge showed that no appreciable amount of submicroscopic aggregates is present. The number-average molecular weights

were determined osmometrically. Measurements of the consistency curves showed the solutions to be typically pseudoplastic. Under normal conditions, neither thixotropy nor yield stress are observed. Within the interval investigated, the consistency curve conforms well to an exponential equation. The value of the exponent can be used as a quantitative measure of the pseudoplasticity. Four different methods for determining the apparent viscosity were tested (Höppler, Ubbelohde, falling-ball, and Brookfield); as expected from the pronounced pseudoplasticity, they give widely varying results. Viscosity values without information about the viscometer used have no value. The advantages and disadvantages of the methods are discussed. Martin's equation for the concentration dependence of the viscosity holds for concentrations below 2%. When a solution is cooled, the viscosity often increases and the turbidity decreases irreversibly. The surface tension of the solutions was lower for a product with a higher ethoxyl content. The efficiency of a number of antifoaming agents is demonstrated. 7 tables, 20 figures, and 58 references. E.S.

CHEMICAL TESTING—BLACK LIQUOR

YOUNG, J. H. Potentiometric titration of black liquors from soda process cellulose pulping. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 875-8 (December, 1951).

The TAPPI Standard 625 m-48 includes a potentiometric method for determining the active alkali in sulfate black liquors; when this method was applied to soda black liquors obtained in the cooking of straw, esparto, and similar materials, no satisfactory results were obtained. However, when any addition of barium chloride to the liquor is omitted and the end point of the titration is raised to a pH value between 11.3 and 12.1 (mean value 11.7) instead of 8.3, using an electrode suitable for such high pH values, the results are in agreement with those obtained by conductometric titrations. A direct measurement of the pH value gives an approximate estimate of the free caustic soda content of a black liquor which is useful for rapid test purposes. 1 table, 1 figure, and 3 references. E.S.

CHEMICAL TESTING—CELLULOSE ESTERS

COX, L. A., and BATTISTA, O. A. Basic degree of polymerization of cellulose acetate. Ind. Eng. Chem. 44, no. 4: 893-6 (April, 1952).

This work was undertaken to show the advantages of measuring the intrinsic viscosity and/or the average basic D.P. of cellulose and cellulose acetates in the same solvent (cuprammonium hydroxide) instead of various organic solvents. A procedure for measuring the intrinsic viscosity and/or the average basic D.P. of cellulose acetates by their simultaneous solution and complete deacetylation in cuprammonium hydroxide solvent is described. The method is applied to studies involving the preparation of cellulose acetates having a wide spread of acetic acid yields and varying compatibilities in organic solvents. Viscosity data for cellulose acetates dissolved in various organic solvents are compared with results obtained for the corresponding regenerated celluloses in cuprammonium hydroxide, and the serious limitations of organic solvents are clarified. A convenient method for converting a single solution viscosity of cellulose acetates that are soluble in an acetone (96%)-water (4%) solvent into basic D.P.'s based on the cuprammonium hydroxide-solvent procedure is given in the form of a calibration curve. A practical proved method for measuring the relative chain length of any cellulose acetate has been established. Expression of chain length in terms of "basic D.P." is recommended in place of measured units such as the viscosity

in centipoises or the fluidity in rhes, because it serves as an effective and uniform way of discussing cellulose degradation data between management, production, and research. 6 tables, 2 figures, and 14 references. E.S.

CHEMICAL TESTING—JUTE—LIGNIN

MACMILLAN, W. G., SEN GUPTA, A. B., and ROY, A. Observations on the determination of lignin in jute. J. Textile Inst. 43, no. 3: T103-11 (March, 1952).

The effect of extended periods of treatment of untreated and partially delignified jute (which contains a higher proportion of xylan) with 72% sulfuric acid at 2°C. was determined, and the time for obtaining the optimum yield of lignin and the rate of formation of condensation products was found to be almost the same in both cases. A preliminary hydrolysis with dilute acid removed a portion of lignin from both raw jute and partially delignified samples, thereby decreasing the yield. A comparative study of the values of lignin obtained from jute by treatment at 2° and at 22° showed that at the higher temperature the increased yield of lignin, in the presence of xylose or xylan, was a result of the formation of furfural-lignin complexes which were not formed at 2°. The formation of condensation products could be eliminated by a preliminary hydrolytic treatment which, however, also removed a portion of lignin. The theoretical value of the lignin content was most nearly approached by omitting the preliminary hydrolysis and treating the material at 2° for 48 hours; the value of lignin removal by acid treatment is compensated for by the formation of condensation products and a slight contamination by nonligneous matter. The lignin content of jute can be determined rapidly by treating the material with 72% sulfuric acid for 45 minutes to one hour at 22° and subsequent dilution of the mixture to 3% acid concentration, refluxing for two hours, and weighing the insoluble residue. 5 tables, 3 figures, and 6 references. M.W.

CHEMICAL TESTING—PULP—COPPER NUMBER

WETLESEN, CARL-ULRIK, and GRAN, GUNNAR. The determination of copper in pulp and paper; investigation of a new reagent for copper. Svensk Papperstidn. 55, no. 6: 212-16 (March 31, 1952). [In English; German and Swedish summaries]

It has previously been found that biscyclohexanone oxalyldihydrazone (I) gives a very sensitive color reaction with copper; the purpose of the present investigation was the study of the reagent for the quantitative determination of small amounts of copper, especially in pulp and paper. In weakly alkaline solution (pH 7-10) a blue color with an absorption maximum at 595 mμ is obtained. The influence of most interfering ions can be eliminated by the addition of citric acid; chromous salts interfere also in the presence of citric acid, but can be readily oxidized to chromic salts. Ethylenediamine tetraacetic acid inhibits the formation of the blue color complex; tartaric acid and oxalyldihydrazide, when tried in place of citric acid, gave too low absorption values. The same took place when the oxalyldihydrazones of acetone or acetaldehyde were substituted for (I). The applicability of the new method to the colorimetric determination of copper in pulp and paper was investigated, and the details of the procedure are outlined. Satisfactory results are obtained when the sample is oxidized with fuming nitric acid and the excess neutralized with sodium hydroxide; ammonium salts in large quantities interfere with the formation of the blue color complex and are not suitable for this purpose. After addition of (I) and suitable dilution, the absorption is measured at 595 mμ. 9 tables, 2 figures, and 1 reference. E.S.

CHEMICAL TESTING—PULP—CUPRIETHYLENE VISCOSITY

VALTASAARI, LEA. Intrinsic viscosity of cellulose in cupriethylenediamine solution. Paper and Timber (Finland) 34, no. 3: 58-62 (March, 1952). [In English]

The intrinsic viscosities of 20 cellulose samples representing the chain-length range from 150 to 2000 were determined by extrapolation from viscosity data of their diluted solutions in cupriethylenediamine. On the basis of the experimental results the author derived an equation from the linear relationship found to exist between the intrinsic viscosity of cellulose in cupriethylenediamine and the logarithm of the relative viscosity of a solution containing 0.1 g. of cellulose/100 ml. of solution: $[\eta] = a \log \eta_r + b$. A comparison of the intrinsic-viscosity values obtained by the use of this equation and the extrapolated values showed that the agreement is within $\pm$ 2%. 5 tables, 1 figure, and 15 references. E.S.

CHEMICAL TESTING—PULP—REACTIVITY

FREY, W., and SCHWALENSTÖCKER, H. The suitability for acetylation of purified pulp. Chem.-Ztg. 76, no. 9: 193-6 (March 25, 1952). [In German]

No clear relationships exist between the usually determined characteristics of a pulp and its suitability for acetylation. The two major requirements for an acetylatable pulp are that (1) the cellulose molecules must be completely free to react, and (2) that the intermolecular conditions are such as to cause the pulp to be reactive. In addition, any impurities which are present should form soluble derivatives. The first requirement can be determined roughly by purity tests, e.g., α-cellulose, pentosans, lignin, etc. The commonly used cellulose tests give no information regarding the second requirement. Consequently, the pulps must be tested by a laboratory acetylation under commercial conditions, for which the procedure is given. The reaction time is noted and the acetate is tested for viscosity, clarity, and most important, filterability. By testing a pulp before and after an activation treatment, the reactivity of the pulp can be determined by difference. These procedures are claimed to overcome certain disadvantages of the methods of Jayme and Schenck (*cf.* B.I.P.C. 15: 320-1; 19: 387-8). 4 references. K.E.B.

CHEMIGROUNDWOOD PROCESS

SCHAFFRATH, P. M. The manufacture and utilization of high quality chemigroundwood pulps. Proc. Forest Products Research Soc. 5: 141-4; discussion; 144-5 (1951); *cf.* B.I.P.C. 20: 635-6.

The chemigroundwood process is described, and the nature of the chemigroundwood pulp in relation to normal groundwood and the general effects of some process variables on the qualities of the resultant pulps is discussed. The various economies possible through the use of this process and the potential applications of the pulps in various papermaking fields are indicated. Emphasis is placed on the conceivable establishment of extended pulpwood supplies through the utilization of hardwood species in areas where the volume of coniferous wood has been depleted. 2 tables and 5 figures. M.W.

CHROMATOGRAPHY

BEVENUE, ARTHUR, and WILLIAMS, KENNETH T. The color

reaction of certain aldehydes with orcinol. Chemist-Analyst 41, no. 1: 5-7 (March, 1952).

An orcinol preparation was found to produce color reactions with various aldehydes on paper chromatograms. The test was quite selective for cinnamaldehyde, *p*-dimethylaminobenzaldehyde, and *p*-hydroxybenzaldehyde. Colors were also produced with vanillin and ethylvanillin, among others. The orcinol reagent did not give a color reaction with the ketones tested, but a definite color reaction was produced with ketose sugars. 1 table and 3 references. M.W.

WILLIAMS, A. F. The application of chromatography to the paper industry. World's Paper Trade Rev. 137, no. 9: 621-2, 624, 629-32, 634 (Feb. 28, 1952).

The use of paper in chromatography is described. Methods are outlined for the separation of small amounts of metal ions on paper strips in conjunction with organic solvents. It is shown that such methods can be extended to the use of columns of cellulose powder, in which larger amounts of the sample are employed. Qualitative and quantitative aspects of these methods are described, and their applicability to the analysis of paper ash is mentioned. The paper medium employed in chromatography is discussed briefly. Reference is made to the use of chromatography in organic separations, and it is shown that chromatographic procedures may be applied to the separation and possible identification of tinting dyes. 1 table, 4 figures, and 20 references. E.S.

COLORIMETRY

GODLOVE, I. H. Near-circular Adams chromaticity diagrams. J. Optical Soc. Am. 42, no. 3: 204-12 (March, 1952).

The author discusses the advantages and disadvantages of the Adams chromatic-value diagram and the development of a chromaticity diagram with near-circular contours and uniform spacing for object colors which permits the rapid evaluation of color differences from X, Y, and Z directly. 2 tables, 5 figures, and 12 references. E.S.

COOKING PROCESS

JAYME, GEORG, and WÖRNER, GÜNTHER. The cooking of sprucewood with alkaline solutions of sodium hydrosulfite. Das Papier 6, no. 5/6: 80-6 (March, 1952). [In German]

In contrast to the data by Montano and Hossfeld (*cf.* B.I.P.C. 22: 171) the authors present the results of experimental cooks which show that satisfactory pulping of wood with sodium hydrosulfite (I) is possible, provided that the correct amounts and concentrations of sodium hydroxide (II) and (I) are selected. With 3-4% (II) increasing additions of (I) up to 7.81% resulted in increasing yields of well-digested pulp; the amount of (I) added should be determined by the correct balance of lignin dissolution and minimum attack on the polysaccharide component. The resulting pulps show a high brightness; the waste liquors are also light-colored so that their re-use might be considered. A comparison of the properties of three pulps obtained by a straight soda (III), sulfate (IV), and hydrosulfite (V) [3.48% (II) and 6.25% (I)] has been made. All three pulps were cooked at 180°C. to give a yield between 44 and 45%. This required four hours in the case of (III) and (IV), and eight hours in the case of (V); the residual lignin in the pulp was 5.7, 3, and 2.17%, respectively. Tabular data on the strength

properties of the unbleached and bleached pulps show throughout increasing values in the order (III), (IV), and (V). The bleachability was determined by a simple procedure consisting of chlorination, alkali treatment, and hypochlorite bleach and resulted in brightness values of 82, 76, and 86%, respectively (as compared with barium sulfate), for (III), (IV), and (V); (V) approaches the high brightness of sulfate pulps obtained with an eight-stage bleaching procedure involving the use of chlorine dioxide. The strength properties of the three bleached pulps showed no decrease, and for breaking length, elongation, and burst, even considerable increases. (V) exhibits the highest strength quality number and total quality number in the case of bleached and unbleached pulps (*cf.* B.I.P.C. 13: 181-2). The studies are being continued. 7 tables, 4 figures, and 6 references. E.S.

CORROSION

HILL, RAYMOND P. The how and why of protective coatings. Paper Trade J. 134, no. 14: 22, 24, 26 (April 4, 1952); Paper Mill News 75, no. 18: 13-15, 17 (May 3, 1952); Pulp & Paper 25, no. 9: 59, 76 (August, 1951). [Abridgment]

The author discusses the classifications of protective coatings and the general properties of some of those most commonly used, including natural and synthetic rubbers, the phenolics, and the vinyls. The importance of respecting coating specifications and limitations to insure satisfactory performance is stressed. M.W.

SHANKWEILER, F. K., BRUXELLES, G. N., and WHITNEY, R. E. Chlorinated rubber corrosion-resistant coatings. Corrosion 8, no. 4: 130-9; discussion: 139 (April, 1952).

The formulation of chlorinated rubber systems is discussed, and numerous case histories of the commercial use of chlorinated rubber coatings are reviewed, including various applications in paper mills. 4 tables and 26 figures. M.W.

COST—ACCOUNTING

KNOTT, RALPH B. Accounting for supplementary costs of labor. Fibre Containers 37, no. 3: 92-5; no. 4: 51-2, 54, 56, 61-2, 64 (March, April, 1952); *cf.* B.I.P.C. 21: 842.

This is the identical article as given in the previous reference; however, the present publication includes copies of the forms actually used by Fibreboard Products, Inc. and subsidiary companies (six exhibits). E.S.

DIELECTRICS—TESTING

CLARK, FRANK M. Moisture in oil-treated insulation. Ind. Eng. Chem. 44, no. 4: 887-93 (April, 1952).

Cellulose insulation in the form of paper sheets, tapes, and pressed boards is widely used in insulating the conductors of most types of electrical equipment. In the high-voltage equipment, the cellulose insulation is commonly impregnated with mineral oil, but in each of its applications the usefulness of the assembled electrical machine is endangered by the presence of moisture in the dielectric. The water content of the mineral oil and cellulose insulation has been correlated with their dielectric properties (power factor and insulation resistance) which, in the absence of a suitable chemical test, are commonly used for detecting the presence of dangerous water concentrations. Properly

applied, the dielectric properties of cellulose can be used to detect and evaluate its moisture content. In the present paper, however, the author demonstrates the technical limitation of the dielectric type of analytical approach to the problem of moisture in cellulosic insulation. He emphasizes the importance of the proper chemical maintenance of the mineral oil impregnant to reduce the chemical and electrical deterioration, which is normally associated with moisture pick-up by cellulose in commercial engineering practice. 1 table, 16 figures, and 24 references. E.S.

DYES AND DYEING

ANON. Practical paper dyeing. Wochbl. Papierfabr. 80, no. 6: 177-8 (March 31, 1952). [In German]

A brief discussion of the dyestuffs used in beater dyeing, the manufacture of mottled papers, calender staining, and the art of practical shade matching is presented. E.S.

DRAPER, A. J. M. Some properties of certain dyestuffs and their relation to two-sidedness of paper. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 751-67; discussion: 768-70 (December, 1951).

An account is given of some experiments which show that certain acid dyestuffs tend to migrate toward the hot surface when a sheet of paper dyed with them is dried by means of a heated metal surface. This gives rise to a two-sided effect which is not shown by similar sheets which have been air dried. Some properties of the dyestuffs in relation to papermaking have been studied and their reaction with a size-alum precipitate investigated. Two-sidedness was found to decrease with the higher degree of aggregation of the dyestuff and to be affected by such factors as solubility, capillarity, temperature, and the presence of aluminum rosinate. 5 tables, 6 figures, and 15 references. E.S.

SIMPSON, G. G. Improved paper coloration with acid dyestuffs. Paper-Maker (London) 123, no. 3: 202, 204 (March, 1952).

The author describes the advantages of a new liquid dye-fixing agent developed by Imperial Chemical Industries Ltd. (Fixanol P) in conjunction with acid dyestuffs used in beater dyeing, including increased dyestuff retention, improved appearance, greater stability to changes in pH, better water fastness, less foaming in the beater, and extension of the range of acid dyestuffs suitable for beater application. Each acid dyestuff requires a specific proportion of Fixanol P if the maximum effect is to be obtained. The addition may be made at any stage of the beating process, but the preferred sequence is Fixanol P, dyestuff, rosin, and alum for colored sized papers; the two last stages are omitted when no sizing is required. E.S.

EUCALYPTUS

MELLER, ALEXANDER. Chemical pulps from Australian eucalyptus. Tappi 35, no. 4: 178-80 (April, 1952); *cf.* B.I.P.C. 20: 713.

The properties of eucalyptus sulfate dissolving pulps resulting from water prehydrolysis at 90-100 p.s.i., followed by a mild sulfate cook at a maximum of 60 p.s.i., are described. 6 tables and 14 references. E.S.

FIBER—DIMENSIONS

ISENBERG, IRVING H. Fiber measurements of tropical wood fibers. Tappi 35, no. 4: 145-7 (April, 1952).

Dimensional data of 12 tropical American hardwoods and of one sample of teak (Burma) are presented and discussed. The fiber lengths of 15 commonly pulped hardwoods of Europe and the United States are also listed. 4 tables and 27 references. E.S.

FIBER—STRUCTURE

ASUNMAA, SAARA, and LANGE, PAUL W. The distribution of the components in the plant cell wall. Part II. Distribution of the carboxyl groups in the cell wall of spruce and birch holocellulose and cotton. Svensk Papperstidn. 55, no. 6: 217-23 (March 31, 1952). [In English; German and Swedish summaries] *cf.* B.I.P.C. 21: 395.

The authors discuss the distribution of the carboxyl groups in the cell wall of spruce (I) and birch (II) holocelluloses and cotton (III) as measured by the light absorption of the colorless carbinol base of Crystal violet which was determined by a microspectrographic technique. Crystal violet reacts with the carboxyl groups in the fiber and gives a more or less faint violet stain, depending on the amount of groups present; that portion of the dye in the fiber which has not reacted remains colorless and is not included in the microspectrographic measurements. Details of the preparation of the samples and the measuring techniques are described. The essential result of the present study is that carboxyl groups in the woody cell wall of (I) and (II) show an approximately linear distribution and that the concentration is very low around the lumen. In the cell wall of (III) the carboxyl groups are principally present in the primary wall; in the remaining cell wall very small amounts, if any, exist. The relationship between the distribution of the carboxyl groups in the woody cell walls and that of the hemicelluloses of the wood is discussed briefly. 1 table, 8 figures, and 20 references. E.S.

WARDROP, A. B., and DADSWELL, H. E. Helical thickenings and micellar orientation in the secondary wall of conifer tracheids. Nature 168, no. 4275: 610-12 (Oct. 6, 1951).

Since the formation of cell-wall thickenings which are present in the prosenchyma of many plants has been shown to reflect a structural differentiation on the cytoplasm, and since the thickenings are an intrinsic part of the cell wall, the possibility of a similar function of the cytoplasm in governing micellar orientation in the cell wall was investigated. A study was made of the variation in the angle of orientation of the helical thickenings with respect to increase in cell length which occurs in successive growth rings from the center of both stems and branches of conifers. Although not conclusive, the findings support the theory that the cytoplasmic surface is a major factor in determining micellar orientation. 3 figures and 16 references. M.W.

FIBERS

SHEARON, WILL H., JR. Natural fibers. Chem. Eng. News 30, no. 16: 1618-21 (April 21, 1952).

The author discusses the uses and current supply and describes experimental work in the cultivation of the following vegetable fibers: jute, ramie, kenaf, abaca, sisal, and henequen. Reference is also made to possible developments in the use of coir fiber, silk grass, kandyr, *Urena lobata*, stockroo, and yucca. 1 table and 4 illustrations. M.W.

FILES AND FILING

"ALARIC." A filing system for paper mill laboratories. Paper-

Maker (London) 123, no. 2: 104-5 (February, 1952).

The author describes his adaptation of the Verner-Larsen classification system (which uses combinations of letters and no figures) to the filing of paper mill laboratory data. 4 tables. E.S.

FINISHING ROOM

WEIBLEN, JACK W. Expediting the packaging and shipping of paper. Paper Mill News 75, no. 15: 10, 12 (April 12, 1952); Southern Pulp Paper Manuf. 15, no. 5: 26, 28 (May, 1952).

The assembly-line system of finishing (trimming, sealing, and packing) which is used at Columbia River Paper Mills is described. M.W.

FLOTATION

JELKS, J. W. Flotation opens new horizons in the paper industry. Paper Trade J. 134, no. 17: 22, 24, 26 (April 25, 1952).

The process of froth flotation and its application in the paper industry are described. In the flotation process the attraction between air bubbles in a slurry and small impurities is employed. A frother, which is usually a slightly ionizable, long-chain alcohol, is mixed into the slurry, and bubbles are formed by introducing compressed air or beating air into the slurry. A collector, a selective reagent which promotes the attraction between the bubbles and the impurities, is added, and the bubbles carry the impurities to the top of the slurry where they can be removed. Hydrocarbons such as xylene, benzene, or kerosene are used as collectors in a deinking process. 6 illustrations. M.W.

FOLDING BOXES

ANON. Folding-box awards. Modern Packaging 25, no. 8: 123-6 (April, 1952); Boxboard Containers 70, no. 712: 10-11, 13 (April, 1952); Am. Boxmaker 41, no. 4: 17-20, 25, 29, 31, 35, 39, 42-4 (April, 1952); Fibre Containers 37, no. 4: 154-7 (April, 1952).

Winning entries in the 1952 carton competition which was sponsored by the Folding Paper Box Association of America are described. Numerous illustrations in each article. M.W.

FORESTS AND FORESTRY

CANADIAN PULP AND PAPER INDUSTRY. Provincial forestry reviews. Can. Pulp Paper Ind. 5, no. 4: 75-6, 78, 80, 82, 84, 86, 88, 90, 93-4, 96, 98, 100, 102, 104, 106, 108 (April, 1952).

The developments in the forest industries of individual provinces during 1951 are reviewed in the following articles: Anon. Booming industry has increased capacity tenfold in 40 years (Newfoundland), p. 75-6; Anon. Pulp and paper accounts for nearly half $41,000,000 output (Nova Scotia), p. 78; Prince, G. H. Fire damage reached low level but spruce budworm is a threat (New Brunswick), p. 80; Anon. Largest province breaks record in pulp and paper production (Quebec), p. 82, 84; Scott, H. R. Canada Forestry Act participation and forestry inventory highlight year (Ontario), p. 86, 88, 90; McDiarmid, J. S. Forest industry output rises with heavy demand for pulpwood (Manitoba), p. 93-4, 96; Churchman, J. W. Preliminary inventory indicates 60,000,000 cords of pulp species (Saskatchewan), p. 98, 100, 102; Anon. Big project planned by Northwest Pulp (Alberta), p. 104; Anon. Important trends are integration and sustained yield from forests (British Columbia), p. 106, 108. Illustrations accompany the articles. M.W.

LANGSAETER, ALF. The growth in Norwegian forests, the quantity for felling available in future years, and the raw-materials supply of the forest industries. Norsk Skogind. 6, no. 2: 38-44 (February, 1952). [In Norwegian; English summary]

Supplemented by statistical data a discussion is given of the annual growth and drain in Norwegian forests and means for reducing the deficit with the least possible hardship on the wood-consuming industries. 4 tables and 2 figures. E.S.

MACDONALD, A. G. Progress in Canadian forestry. Can. Pulp Paper Ind. 5, no. 4: 110, 112, 114, 116, 166 (April, 1952).

The activities of Canadian government forestry organizations in the study of insect control, fire prevention, and reforestation are reviewed. 2 illustrations. M.W.

MOREY, C. L. First chemical pulp utilization in the state of California. Proc. Forest Products Research Soc. 5: 146-9; discussion: 149 (1951).

Following a description of the San Joaquin Division of Fibreboard Products Inc. at Antioch, Calif. (*cf.* B.I.P.C. 22: 481), the author discusses the general state of the wood supply for forest industries and the results of scientific and empirical research on the reduction of wood residues and the profitable growth of timber. M.W.

GAS TURBINES

ATHERTON, GEORGE H., and CORDER, STANLEY E. Sawdust as fuel for new type gas turbine. Paper Trade J. 134, no. 14: 18 (April 4, 1952); Mech. Eng. 74, no. 5: 409-10 (May, 1952). [Abridgments]

A sawdust-fed gas turbine which was developed at the Oregon Forest Products Laboratory, Corvallis, Ore. has produced combustion efficiencies of 92.5-99%. The experimental gas turbine is an aircraft turbosupercharger set up as an open-cycle gas turbine employing a waste wood-fired combustion system. M.W.

GLYCERIN

ANON. Glycerine producers challenged. Chem. Eng. 59, no. 4: 232, 234-6 (April, 1952).

During 1952 synthetic glycerin will account for 55 million pounds of the estimated total U. S. glycerin production of 255 million pounds. All of the synthetic supply will come from the Shell Chemical Corp. plant at Houston, Tex. It is made by chlorinating propylene at 500-600°C. and converting the allyl chloride to crude glycerin, which is concentrated, desalted, and purified. Production facilities for natural glycerin have been undergoing expansion, and new ion-exchange techniques are being used in its purification. The largest single use of glycerin is in alkyd resins, but it is also used in tobacco as a humectant, in explosives, as a plasticizer in cellophane and paper, and in other applications. Although it is still the most widely used polyol, glycerin is being challenged by pentaerythritol in the manufacture of alkyd resins and by sorbitol in a wide range of uses. 3 figures. M.W.

GRASSES

SINGH, CHATTAR, and GUHA, S. R. D. Pulping of illuk grass

(*Imparata arundinacea*) by soda and mono-sulphite processes. Indian Forester 77, no. 10: 651-60 (1951).

A chemical analysis of a representative sample of illuk grass and the results of a microscopical examination of the fibers are given. Cooking experiments with the monosulfite (I) and the soda (II) processes were carried out to determine the respective economics of each process. The cost of chemicals required for pulping the grass by (I) was found to be 38% higher than by (II). The fractional or two-stage method of digestion by (II) gave the most satisfactory results and is recommended for the pulping of illuk grass. 4 tables and 5 references. M.W.

GUMS AND RESINS

HOUGH, L., JONES, J. K. N., and WADMAN, W. H. Some observations on the constitution of gum myrrh. J. Chem. Soc.: 796-800 (March, 1952).

The isolation and characterization of D-galactose, L-arabinose, and 4-methyl D-glucuronic acid as components of gum myrrh are described. E.S.

HARD WOODS

BHAT, R. V. Pulping of tropical woods and other indigenous cellulosic raw materials. Tappi 35, no. 4: 183-90 (April, 1952); *cf.* B.I.P.C. 22: 277.

The results of investigations on the chemical, semichemical, and mechanical pulping of some Indian tropical hardwoods (*Boswellia serrata, Lannea grandis, Sterculia campanulata, Broussonetia papyrifera, Helicteres isora, Garuga pinnata,* and *Albizzia stipulata*) are presented; in addition, data on *Arundo donax, Phragmites karka,* ulla and panni grass, castor oil plants, and jute are given. 10 tables and 9 references. E.S.

COOMBER, HENRY E. Colonial tropical hardwoods as papermaking materials. Tappi 35, no. 4: 161-6 (April, 1952); *cf.* B.I.P.C. 22: 331-2.

The results of microscopical and chemical studies of a number of tropical hardwoods from British Guiana, British Honduras, Nigeria, Trinidad, South Africa, and Tanganyika for evaluating their suitability as papermaking raw materials by the Colonial Products Advisory Bureau (previously the Imperial Institute) are presented. 4 tables and 9 references. E.S.

FARMER, R. H., and CAMPBELL, W. G. Chemical utilization of tropical hardwoods. Notes on current work at the Forest Products Research Laboratory, Princes Risborough, England. Tappi 35, no. 4: 181-3 (April, 1952).

Studies for the chemical utilization of three British Guiana hardwoods (wallaba, mora, and morabukea) are reported; the most extensive studies have been made with wallaba, although in all three cases the chemical investigation of the wood extractives is far more advanced than the study for determining the suitability of the extracted chips for fiberboard production. A dual process of utilization would determine the feasibility of exploitation of these species. 1 table, 1 figure, and 4 references. E.S.

PETERI, R. Pulping studies with African tropical woods. Tappi 35, no. 4: 157-60 (April, 1952); *cf.* B.I.P.C. 21: 713.

The work of the Régie Industrielle de la Cellulose Coloniale for studying the utilization of the products of the African forests and savannahs, especially for pulp- and papermaking, is outlined; the pilot plant at Bimbresso on the Ivory Coast, French West Africa, is described. The possibilities of large production units in tropical areas are discussed. E.S.

RUNKEL, ROLAND O. H. Development of chemical and semichemical processes for deciduous trees with special consideration of tropical woods of western Africa. Tappi 35, no. 4: 174-8 (April, 1952); *cf.* B.I.P.C. 22: 134.

The suitability of semichemical pulping for hardwoods is discussed, with particular reference to its possibilities for mixed cooks from different species of tropical woods. 4 tables, 6 figures, and 19 references. E.S.

WANGAARD, FREDERICK F. The physical properties of tropical woods. Tappi 35, no. 4: 137-42 (April, 1952).

The mechanical properties of a number of tropical woods in green and air-dry conditions are given and the results are compared with those from a representative group of temperate-zone woods on the basis of specific gravity. 1 table, 7 diagrams, and 3 references. E.S.

HISTORY

CANADIAN PULP AND PAPER INDUSTRY. E. B. Eddy starts second century. Can. Pulp Paper Ind. 5, no. 4: 136, 138 (April, 1952); *cf.* B.I.P.C. 21: 714.

A brief history of the E. B. Eddy Company, one of the largest pulp and paper producers in Canada, is presented. 3 illustrations. M.W.

INSTRUMENTATION

MURPHY, E. A. Graphic panels promote efficiency. Paper Ind. 34, no. 1: 71-3 (April, 1952); *cf.* B.I.P.C. 22: 585.

The development and purpose of graphic panels is described, and an example of a graphic panel prepared for a brown stock-washing system is discussed. In every instance, graphic panels are custom engineered for each specific application, and each case must be studied on its own merits. Mention is made of some of the factors which should receive consideration prior to an installation of a conventional or graphic panel. In a continuous process made up of a number of interrelated pieces of processing equipment (some of which are located quite a distance from the central control panel) and with a shortage of available skilled operators and difficulties in training facilities, a graphic panel will be a good investment. 4 figures. E.S.

WEXLER, ARNOLD, and BROMBACHER, W. G. Fundamental techniques for calibrating hygrometers. Instrumentation 5, no. 6: 25-7 (January-March, 1952).

Section 5, Test methods, of the National Bureau of Standards circular 512 "Methods of measuring humidity and testing hygrometers" is reprinted. 3 tables, 7 figures, and 11 references. E.S.

WHEELER, G. E. Is instrumentation necessary? Can. Pulp Paper Ind. 5, no. 4: 164-5 (April, 1952).

Modern production rates and methods make instrumentation a necessity, and when installed, it should be used to the fullest advantage. 3 illustrations.
M.W.

JUTE

CALLOW, H. J. Acetylation of cellulose and lignin in jute fibre. J. Indian Chem. Soc. 28, no. 11: 605-10 (November, 1951).

Acetylation of the jute fiber not only retards the discoloration but also brightens the color on exposure to light. This effect may be due to a bleaching reaction caused by acetyl peroxide (I) formed by the action of light. To establish which component of acetylated jute contains labile acetyl groups capable of forming (I), 5-g. samples of defatted jute were refluxed with 200 g. of acetic anhydride, 50 g. of acetic acid and 60 g. of potassium acetate for 2, 17, and 48 hours; they gave acetylated jute fibers (II) with 28.9, 32.3, and 38.3% acetic acid content, respectively. From (II) the acetylated cellulose (III) was isolated by alternate chlorination and extraction with a neutralized 1% sodium sulfite solution for 10 minutes on a water bath until no more color developed, and gave 82.7, 82.9, and 84.9% (III) with 27.5, 31.9, and 37% acetic acid content, respectively. The isolation of (III) was much more difficult than that of cellulose from untreated jute and up to 10 alternate treatments were required. Because the cellulose content increased in (II), it seems that polyuronide hemicelluloses were removed during the acetylation. The lignin was isolated by boiling 3 g. of (II) with 75 ml. of acetic acid containing 0.25% concentrated hydrochloric acid for two hours, pouring the concentrated extract into 300 ml. of water, and boiling the mixture for five minutes; 7.49, 7.85, and 8.45% acetylated lignin (IV) with 33.7, 33.7, and 38.5% acetic acid and 17.9, 15.3, and 9.77% methoxyl (after saponification) were obtained. The original jute contained 68.8% cellulose and 9% lignin with 12.4% acetic acid and 17.9% methoxyl (on the acetic acid-free basis). The high acetyl content of (IV) after 48 hours acetylation indicates that the lignin is not completely acetylated but that methoxyl groups have been replaced by acetyl groups. 3 tables.
F.E.B.

LATEX, SYNTHETIC

ZWICKER, B. M. G. Latices of flexible synthetic polymers. Ind. Eng. Chem. 44, no. 4: 774-86 (April, 1952).

During the past 10 years there has been rapid progress in the manufacture and use of flexible synthetic polymers. There are now nearly 200 synthetic rubber, plastic, or plasticizable polymer latices commercially available in the United States, which have been grouped into 15 classes according to reported polymer composition. General properties of synthetic latices are discussed, including the effect of particle size on stability and viscosity; characteristics of typical emulsifiers and dispersing and thickening agents and their influence on stability, coagulability, and application; and wet- and dry-film strength properties of typical synthetic polymers. The adoption of the soap requirement titration for control of synthetic latex compounds is recommended. Each class of polymer is discussed with reference to inherent polymer properties and their relationship to principal applications. Certain deficiencies in existing materials are pointed out. New products entering the market include water-dispersible polymers (for hydrosols), water-soluble polymers (polyelectrolytes and hydrophilic compounds), and plastisols (resins dispersed in plasticizers). The first two types are classified by composition, and the general properties of each class are summarized. 4 tables, 1 figure, and 194 references.
E.S.

LIGNIN

LEOPOLD, BENGT. Studies on lignin. Part IX. The production of vanillin by oxidation of lignin with nitrobenzene and alkali. Svensk Kem. Tid. 64, no. 1: 1-18 (1952). [In English] *cf.* B.I.P.C. 22: 499.

The possible use of decayed wood for the commercial production of vanillin by the nitrobenzene and alkali process was investigated. The optimum conditions for the production of vanillin from decayed wood and the corresponding consumption of reagents were determined on a laboratory scale. The investigations were continued on a larger scale, and the decay with *Lenzites sepiaria* was carried out with amounts of wood as large as 75 kg. Nitrobenzene oxidations were made in a continuous flow apparatus, and the yields were the same as those obtained in the laboratory. The isolation of the product by means of extraction with trichloroethylene was studied, and it was shown that a product of good quality could be obtained fairly readily. On the basis of these and previous results the author discusses the possibility of adapting the process to commercial production. The cost of the projected process is compared with the ordinary clove-oil process, and it is shown that the former method may well compete with the latter as regards economy and quality of product. [Abstracter's note: clove-oil vanillin can not compete in the United States with either lignin vanillin or synthetic vanillin.] 7 tables, 15 figures, and 17 references. I.A.P.

LEOPOLD, BENGT. Studies on lignin. Part XI. Studies on the alkaline nitrobenzene oxidation of lignin and lignin models. Svensk Kem. Tid. 64, no. 1: 18-26 (1952). [In English] *cf.* B.I.P.C. 22: 581-2.

This paper presents a review of the earlier papers in this series, and the results obtained in the various phases are discussed in relation to each other. The entire investigation was an attempt to develop an economical method for the production of vanillin from lignin sources by the alkaline nitrobenzene method. 36 references. I.A.P.

LOADING AND UNLOADING—CARS

PREBISH, RAY. "We stopped damage claims." Food Eng. 24, no. 4: 99-100, 141, 143 (April, 1952).

Shipping damage claims have been virtually eliminated by a West Coast producer of sea-food products through the adoption of box cars equipped with a car-loading device that eliminates conventional dunnage and the use of a "bonded-block" method of stowing cartons in box cars. The load-locking device consists of steel-reinforced wood cross members which are locked into longitudinal car wall members and hold the load tightly in position. The purpose of the bonded-block method is to distribute the weight of one layer on another and to divide the load into sections. This is accomplished by loading alternate layers in lengthwise and crosswise positions. 3 illustrations. M.W.

MACHINERY—BOARD MACHINES

PIKE, G. H. Cylinder mould machines. World's Paper Trade Rev. 137, no. 13: 919-22, 924, 929-33 (March 27, 1952).

An account is given of the general principles of formation on cylinder-mold machines, including a brief note on their early history. This is followed

by a detailed description of the various kinds of multicylinder board machines and a brief mention of other types of cylinder-mold machines, including the combination cylinder and Fourdrinier machine, the intermittent cylinder board machine, and the cylinder-mold banknote and imitation handmade machines. 8 figures and 5 references. E.S.

MACHINERY—CABLES

MORTENSON, A. O. Electrical Engineering Committee. Cable Subcommittee. Tappi 35, no. 4: 125-40A; discussion: 140-8A (April, 1952); *cf.* B.I.P.C. 22: 110.

The minutes of the third meeting of the TAPPI Cable Subcommittee and the second meeting of the Joint Committee of the Technical Association of the Pulp and Paper Industry and the Insulated Power Cable Engineers Association (IPCEA) are presented. The pertinent IPCEA standards and testing methods for insulated wires and cables are given in full, as well as the meeting's final recommendations for such specifications in the pulp and paper industry for presentation to TAPPI at the annual meeting. Numerous tables are included. E.S.

MACHINERY—CHIPPERS

DELORO SMELTING AND REFINING COMPANY. Stellited face plates for chippers. Pulp Paper Mag. Can. 53, no. 4: 184 (March, 1952).

Stellited face plate segments which will provide satisfactory protection for the complete wearing surface of chipper disks have been developed. The segments, ten of which are fastened to the disks by means of stellited flathead bolts, have a heavy thickness of Stellite, which is a welded deposit that cannot peel or flake. The chipper disks so protected should give years of maintenance-free service. 1 illustration. M.W.

MACHINERY—CONVERTING MACHINERY

ASKANIA REGULATOR COMPANY, *Chicago.* Eliminates wasted chipboard while cutting labor in lamination. Chem. Processing 15, no. 4: 8 (April, 1952).

In order to control the position of the merging paper webs in the laminating process, Askania edge position equipment was installed at the Morris Paper Mills, Morris, Ill. With this equipment laminate layers match to within 1/32 in., and the former practice of trimming 0.5 in. from each edge to even the paper layers is no longer necessary. 2 figures. M.W.

MACHINERY—DRIVE, ELECTRIC

SPENCE, W. Electric drives in papermills, with particular reference to closed-loop control. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 681-98; discussion: 699-706 (December, 1951).

The principles of operation of closed-loop control in general, the usual elements comprising such a system, and the advantages to be gained by its use are described. The essential features of a closed-loop control system are automatic operation and regulation of the controlled quantity with a specified degree of accuracy without fatigue. One type of d.c. rotary amplifier, the amplidyne, is described in some detail, since it is frequently used in closed-loop control systems of the type discussed in the present paper. The following examples of applications in paper mills are given: helper drives

with torque or speed control; control of paper tension on supercalenders, rewinders, and paper machine reels (the latter by electronic means); and control of speed on a rewinder. Some of the problems facing the designer of closed-loop control systems are mentioned. 17 figures. E.S.

MACHINERY—DRYERS

LAAKSONEN, JUKKA. The possibilities for increasing the efficiency of cylinder driers. Paper and Timber (Finland) 34, no. 3: 63-8 (March, 1952). [In Finnish; English summary]

The production limit of a mill is often determined by its drying capacity. The author discusses the possibilities for increasing the efficiency of existing drier sections, i.e., where circumstances do not permit extensive alterations or new installations. Strict attention should be paid to the uniform thickness and moisture content of the web in both longitudinal and transverse directions, and defects from headbox to the last drying cylinder which exert an unfavorable influence on these factors should be corrected. The operation of the rubber-covered press rolls should be watched in particular. With comparatively inexpensive additional devices, such as the Berggren-Sundblad and Rotabelt suction boxes in the wire section, the drying capacity can be increased by at least 10%. Another possibility is the use of infrared heaters for warming the web just prior to its entrance to the cylinder section. Different devices and methods in use for the removal of condensate and air from the driers are also discussed. 5 figures. E.S.

POWER JETS, *London*. The pressure still and the drying process; possibilities of extended applications. World's Paper Trade Rev. 137, no. 8: 516, 519-20 (Feb. 21, 1952).

With reference to the paper by Johnson on the applicability of the gas turbine (*cf.* B.I.P.C. *22*: 251), the possibilities of the pressure-still principle applied to the drying of paper are discussed. 1 diagram. E.S.

THE SPOONER DRYER AND ENGINEERING COMPANY, LTD. Spooner patent evaporator for fitting on M.G. machines. World's Paper Trade Rev. 137, no. 12: 854, 856-8 (March 20, 1952); Paper-Maker (London) 123, no. 4: 308-10 (April, 1952); *cf.* B.I.P.C. 21: 404, 629.

Essentially the same information as in the previous references is given. 3 illustrations. E.S.

MACHINERY—ELECTRIC EQUIPMENT

MARKLE, L. E. Maintenance of electric controllers. Paper Ind. 34, no. 1: 74-8 (April, 1952).

Directions for the preventive maintenance of electric motor controllers with particular emphasis on safety to personnel are given. A sample record for controller- and motor-maintenance information is included. 11 figures. E.S.

MACHINERY—GRINDERS

KLIMPKE, KARL. Analysis of the Roberts grinder. Wochbl. Papierfabr. 80, no. 4: 107-10 (Feb. 29, 1952). [In German]

The construction, mode of operation, and results obtained with the Roberts grinder are discussed with reference to the pertinent literature (*cf.* B.I.P.C. 19: 403; 21: 323). 2 tables, 3 figures, and 4 references. E.S.

MACHINERY—LAY BOYS

MAXSON AUTOMATIC MACHINERY COMPANY, *Westerly, R.I.* Stacking sheets continuously at the end of cylinder board machines. Southern Pulp Paper Manuf. 15, no. 4: 42, 44-6, 48 (April, 1952); *cf.* B.I.P.C. 22: 412.

The development of continuous running pilers, or layboys, is reviewed, and descriptions are given of the initial installation at the Michigan Carton Company and of the installation at Sutherland Paper Company. 5 illustrations. M.W.

MACHINERY—PRESSES

HEYS, RALPH C. A brief history of vacuum pick-up. Paper-Maker (London) 123, no. 3: 213-21, 223 (March, 1952).

The author reviews the developments for eliminating the stretch in transferring the wet sheet of paper (light or heavy grades) from the Fourdrinier to the press section, particularly on high-speed machines. Reference is made to the Millspaugh stacked press with vacuum pick-up (originally patented in 1931), and various modifications with stacked and semistacked presses to suit individual mill conditions are described. Recommendations for installations in existing machines are made, and the need for further research in the design of satisfactory pick-up felts for vacuum transfer is emphasized. 4 tables and 27 diagrams. E.S.

MACHINERY—PRINTING MACHINE

GREAT LAKES BOX COMPANY. Machine die cuts . . . then prints. Boxboard Containers 70, no. 712: 6-8 (April, 1952).

A new machine which is called the Autovariable and is made by J. Bobst & Son, Switzerland, is being used for an inline procedure of carton manufacture. The operation includes multicolor rotary printing, platen cutting-creasing, and partial stripping, but the equipment reverses the conventional method by cutting and creasing before printing. The printing section of the machine consists of two letterpress and two "indirect printing" units. Indirect printing employs typo plates in reverse and transfers its impression to a rubber blanket and then to the paperboard surface. This combination produces multicolor-printed cartons at a substantially reduced cost. 6 illustrations. M.W.

KRAFT FOODS COMPANY. Desirable case printing on-the-line can be done. Packaging Parade 20, no. 231: 68-9 (April, 1952).

Printing equipment which was designed to print containers of different sizes on the assembly line is described. Two sides of the cases are printed at the same time, and the direction of the box is automatically changed to print the other two sides. A pumping system furnishes ink to the vertical dies, and a timing unit controls registration to assure precise case positioning. 7 illustrations. M.W.

MACHINERY—REFINERS

BRECHT, WALTER, and MÜLLER, ERICH. A comparison between jordan-type and disk refiners in a groundwood mill. Das Papier 6, no. 5/6: 86-94 (March, 1952). [In German]

Measurements of the efficiency of different refiners for groundwood screen-

ings were made under actual operating conditions. The pulp (for newsprint and groundwood printing paper) was produced on two Voith continuous grinders at a consistency of 1-1.5% ovendry and a temperature of 60°C. in the pit. The rejects were subjected to a one-stage screening process. The refiners employed included a Voith-Nacke disk refiner (I) and two Voith jordans (Type 49), of which one was equipped with steel bars on cone and shell (II), and the other with steel bars on the cone and a basalt lava lining on the shell (III). The measurements on (I) were limited to the relationship of the throughput to the degree of refining (percentage of slivers) and power consumption; those on (II) and (III) included in addition studies on the relationship of power consumption to r.p.m. and shell setting. Details of the experimental procedures are given. The results showed a decided superiority of (II) with regard to decrease of slivers and power consumption. An increase in r.p.m. and pressure of both jordans resulted in a higher decrease of slivers, which was particularly noticeable in the case of (II). However, both jordans produced an appreciable amount of the "flour" fraction, although considerably less than (I). The lower initial cost and space requirements of (II) as compared with (I) are other factors in its favor; maintenance costs have not been studied. In agreement with the statements by Maynard (*cf.* B.I.P.C. 21: 782), the limitations of mill-scale experiments are emphasized, particularly the impossibility of sample taking and measurements in certain crucial locations. Hence, the present data indicate trends rather than absolute measurements. Attention is also drawn to the fact that the present results hold only for the mill and operating conditions described. A flowsheet of a groundwood stock-preparation system is included in which consideration is given to the possibility of adequate measurements at important points, and its adoption in new installations is recommended. 6 tables, 7 figures, and 11 footnotes. E.S.

MACHINERY—ROLL GRINDING APPARATUS

M.P.J. GAUGE AND TOOL COMPANY, LTD., *Birmingham, England.* Roll surface accuracy. World's Paper Trade Rev. 137, no. 14: 1003-4 (April 3, 1952).

A new caliper gage is described which will reveal inaccuracies of roll surfaces in grinding and after assembly up to 0.00005 inch. The use of the instrument is outlined. 1 illustration. E.S.

MACHINERY—SAWS

ADAIR, NELSON T. Steps in chain saw development. Pulp Paper Mag. Can. 53, no. 4: 150 (March, 1952).

The author presents an account of the development of the chain saw, points out the advantages which it provides to workers, and makes some suggestions with regard to its more efficient operation. M.W.

ANON. Use of power saws in Québec. Pulp Paper Mag. Can. 53, no. 4: 147, 149 (March, 1952).

A significant increase in the use of power saws has resulted from improvements in the lighter beaver-tail models, the aid given to the men by the operators in the financing of their purchase, and the organization of training and service facilities. The increase in production which is effected by their use is estimated at 20%, with increases of 30-50% in some cases. 6 illustrations. M.W.

MACHINERY—SPEED REGULATORS

BAKER, R. R., and CROCO, C. P. Applying speed regulators. Pulp & Paper 26, no. 4: 84, 86, 96 (April, 1952).

A discussion of rotating, electronic, and magnetic speed regulators is presented. 1 table and 5 figures. M.W.

MACHINERY—STEAM TRAPS

WILLIAMS, A. E. The draining of steam and air lines. World's Paper Trade Rev. 137, no. 8: 553-6 (Feb. 21, 1952).

The principles and correct applications of labyrinth, thermostatic, and mechanical steam traps in steam lines and the use of float traps and strainers in compressed-air lines are discussed. 3 figures. E.S.

MACHINERY—WAXING MACHINE

COUTURE, J. W. Quality production on high speed waxing machines. Parts I and II. Am. Paper Converter 26, no. 3: 10-11, 68; no. 4: 14-15, 62, 65 (March, April, 1952).

The development of the modern waxing machine is traced, and data which were obtained through the use of the all-electric, multimotor, d.c. drive with tension and speed control are analyzed to illustrate the degree of speed and quality control which is possible with modern equipment in the manufacture of waxed paper. 26 figures. M.W.

MATERIALS HANDLING

ANON. Interplant mechanized materials handling. Allg. Papier-Rundschau no. 6: 267-9 (March 26, 1952). [In German]

The advantages and possibilities for increasing the productivity in the paper industry by mechanized handling of waste paper and paper rolls are demonstrated; examples of German equipment are given. 7 illustrations. E.S.

DAY, FREDERICK T. Mechanical handling and storage of paper. Paper Box Bag Maker: 96-7, 99 (March, 1952); Paper Market: 87-9 (April, 1952).

Comparative costs for labor and mechanical handling are considered, some fundamentals in the development of a material-handling program are outlined, and reference is made to current equipment for mechanical handling, particularly the fork truck. 2 illustrations. M.W.

METERS AND RECORDERS

MASON-NEILAN REGULATOR COMPANY, *Boston.* New moisture control system. Paper Mill News 75, no. 15: 14 (April 12, 1952).

A new moisture control system employs the constant-steam flow and variable-pressure principle for automatically maintaining the moisture content of a paper sheet within close limits on any grade or weight of paper and with any machine speed or width. 4 illustrations and 1 flow diagram. M.W.

MOTION STUDIES

CONNAL, J. M. The application of time and motion study to the

paper industry. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 789-802; discussion: 803-11 (December, 1951).

Following a brief survey of the history and development of time and motion studies into modern work study as applied to industry, its possibilities as a basis for incentive application, production control, planning and progressing, and cost control are outlined. A review of the results achieved in practice by the application of work study with special reference to paper mills is given. The reaction and effect of the application of work study on operators, supervision, and management is discussed, with some notes on the effect on the quality of work produced. The normal procedures involved in the introduction and maintenance of the techniques are described briefly. The author emphasizes that by this comparatively simple procedure, productivity can be very substantially increased without new machinery or new buildings, and at the same time higher wages can be paid as a result of greater production and not of further inflationary tendencies of the market. E.S.

MUCILAGE

SUZUKI, H. A study of vegetable mucilages for Japanese paper. J. Japan. Tech. Assoc. Pulp Paper Ind. 6, no. 1: 22-7, 91-2 (February, 1952). [In Japanese; English summary]

In the manufacture of Japanese paper a vegetable mucilage such as tororoaoi (*Abelmoschus manihot* Medic.), noriasa (a mixture of tororoaoi and okra [*Abelmoschus esculentus* Moench.]), or ninori (*Hydrangea paniculata* Sieb.) is added to obtain a uniform sheet. The mechanism of uniform sheet formation is discussed principally from the standpoint of water drainage. In a study of drainage time with the use of the upper portion of a Schopper freeness tester, it was found that drainage is a function of the amount of mucilage added, pulp consistency, resistance of the fiber layer, resistance of the filtering material, the degree of beating of the pulp, water temperature, filtering area, and head difference in the vat. 2 figures and 13 tables. E.G.S.

NATIONAL PRODUCTION AUTHORITY (NPA)

MALONEY, JOHN W. Here we are. Paper Trade J. 134, no. 14: 28, 30, 32, 34 (April 4, 1952); Am. Paper Merchant 49, no. 5: 26, 42, 44 (May, 1952); Am. Paper Converter 26, no. 5: 21, 66 (May, 1952). [Abridgments]

The author describes the program, policy, and activities of the Pulp, Paper and Paperboard Division of the National Production Authority. 1 table. M.W.

PAPER MILL NEWS. Orders released by NPA—OPS. Paper Mill News 75, no. 16: 114, 130 (April 19, 1952).

The orders concerning pulp, paper, and board which were issued by the National Production Authority and the Office of Price Stabilization during the period from April, 1951 to March, 1952 are listed. M.W.

NEWSPRINT

FOOTE, R. W. Half world newsprint from Canada. Can. Pulp Paper Ind. 5, no. 4: 18-19 (April, 1952).

In 1951 Canada accounted for 5,516,279 tons of the world output of 10,215,652 tons of newsprint (including an estimated 4% produced by

Russia). Of this total 5,143,616 tons, or 83%, were exported; the United States received 89.4% of the total shipments. World production in 1951 increased by 4.5%, and the shortage which has prevailed since World War II as a result of increased demand in North America should be alleviated in 1952. 1 table and 1 illustration. M.W.

PACKAGING

ANON. The joint military packaging course. Fibre Containers 37, no. 4: 42, 44, 46 (April, 1952).

A description is presented of the joint military packaging course which includes two weeks' instruction on standard military practices and procedures in packaging and on the principles related to the storage and shipment of materiel. The course has been conducted at the Rossford Ordnance Depot, Toledo, Ohio. The testing laboratory at the school makes available to trainees up-to-date technical information, and the principles of packaging and packing are applied through practical training on a well-equipped packaging line. 3 illustrations. M.W.

ANON. Pliofilmed smokes. Chem. Week 70, no. 15: 13-14 (April 12, 1952).

The use of Pliofilm for the outer wrapping of cigarette packages is being considered. It offers the advantages of superior moisture retention and excellent heat-sealing qualities. However, problems which result from its natural tackiness, lower flexibility, more difficult packaging techniques, and higher cost, will have to be solved before it replaces cellophane to any extent. 1 illustration. M.W.

ANON. Small packager. Modern Packaging 25, no. 8: 103, 188 (April, 1952).

A completely manual, small-scale packaging operation is described which was developed by a restaurant for marketing a precooked, quick-frozen turkey specialty. The container is a one-piece, tuck-top waxed carton of white-lined, solid manila board which is overwrapped with printed cellophane. The cartons are filled, closed, locked, wrapped, and heat sealed by a staff of six girls, and production averages 750 cartons per day. 3 illustrations. M.W.

BIRTLES, R. H. Plastics in packaging. J. Inst. Packaging 2, no. 13: 3-9 (3rd quarter, 1951).

The properties and packaging applications of the following plastics are described: phenol-, urea-, and melamine-formaldehyde resins, polystyrene, polymethyl methacrylate, cellulose acetate, cellulose acetate butyrate, ethylcellulose, polyvinyl chloride, polythene, Pliofilm, and regenerated cellulose film. M.W.

FALK, ROGER. Packaging for export. J. Inst. Packaging no. 12: 23-5; discussion: 25-6 (Mid-year, 1951).

In addition to the need for protective export packaging, the author emphasizes the importance of analyzing market conditions at the point of sale so that national tastes, customs, and prejudices can be respected and the product will appear attractive and desirable to the consumer. M.W.

THE KRAFT FOODS COMPANY. Portion control. Modern Packag-

ing 25, no. 8: 90-1, 193 (April, 1952); Packaging Parade 20, no. 231: 72-3 (April, 1952); Modern Plastics 29, no. 9: 84-5 (May, 1952).

Individual portions of food are being packaged in single-service containers made of calendered vinyl plastic with a plastic film closure heat sealed to the top edge. The container is a square structure approximately 1¼ in. wide and ⅝ in. deep and is fabricated automatically at high speed in the packager's plant just prior to filling. The "portion control" packages are practical for restaurants, dining cars, and institutions, are easy to store, serve, and handle, and provide complete sanitary protection. At present they are used for jams and jellies but will be used for a wide variety of food products in the near future. 6 illustrations. M.W.

NELSON, FELIX. Sold on paper. Paper Sales 12, no. 4: 16-17 (April, 1952).

A meat-market manager describes the advantages of prepackaging meats in cellophane or Pliofilm. A substantial increase in sales and a reduction in labor costs resulted from the adoption of this practice. 2 illustrations. M.W.

STUDD, F. T. Packaging for air transportation. J. Inst. Packaging no. 12: 26-7; discussion: 27-8 (Mid-year, 1951).

Air transportation of goods offers the advantages of speed, expeditious handling, wider sales distribution, and other similar factors which depend on the nature of the goods. The ideal container for air freight is one which is lightweight, inexpensive, and shock absorbent, affords maximum protection against pilferage, provides efficient sealing, and requires little storage space. Transparent packages and combinations of plastic films and paper or cardboard have proved to be suitable for containers for air freight. M.W.

PAPER—COATED

ALLIANCE PAPER MILLS, *Georgetown, Ont.* Modern electrical equipment in high speed paper coating. Can. Chem. Processing 36, no. 3: 80-2 (March, 1952).

The coating process and the Microjet coater (*cf.* B.I.P.C. 17: 74) which are used in the production of standard and specialty coated papers are described. 7 illustrations. M.W.

DILTS MACHINE WORKS, *Fulton, N.Y.* Dilts' new pilot plant coater can be used for testing and lab runs. Am. Paper Converter 26, no. 4: 27 (April, 1952).

A new precision-built, pilot-plant coating machine (Contracoater) which will also do commercial coating at speeds up to 1500 f.p.m. is described. Pneumatic and electronic controls provide data at every section of the machine; controlled and constant tension is obtained by means of a Kohler-system running belt tension on the unwinding stand and an electronically controlled, constant-tension winder. The unit can be threaded in 29 different ways for coating and laminating. 1 illustration. M.W.

PAPER—COATED (HOT-MELT)

H. P. SMITH PAPER COMPANY, *Chicago.* Saran-coated kraft developed. Paper Sales 12, no. 4: 34, 36 (April, 1952); *cf.* B.I.P.C. 22: 593.

A saran-coated kraft paper has been developed to replace the expensive saran-kraft lamination. It possesses excellent chemical resistance, low water-vapor and gas transmission, and good heat sealability. The coating also improves the tear, tensile, and bursting strength of the paper. It is made in an industrial and in a nontoxic, odorless, and tasteless grade for packaging food products. M.W.

PAPER—CURLING

ABELE, W. Restless paper; waviness of wood-free writing and book papers. Allg. Papier-Rundschau no. 6: 270-1 (March 26, 1952). [In German] *cf.* B.I.P.C. 22: 593-4.

With reference to the curling problem discussed in previous references, additional cures for the defect are suggested. The Scotch paper-maturing machine in which each individual sheet is exposed cannot be replaced by storage of (usually quite high) piles in an air-conditioned room; the beneficial effect of continuous stock preparation as practiced in America is emphasized; and the addition of regenerated waste paper with "dead" fibers is recommended for moderating the activity of the "restless" virgin pulp fibers. The correct selection of the furnish is one of the essential prerequisites which, however, cannot always be carried out in times of raw-material shortages. With the consent of the purchaser and for short-lived printing pieces, the addition of bleached groundwood pulps may help to overcome the trouble in certain instances. 2 references. E.S.

PAPER—DEFECTS

KOVEC, JOSEPH. Wrinkles. Inland Printer 129, no. 1: 52, 101 (April, 1952).

Wrinkles in printed paper may be caused by worn bearers which are lower than the regular type form and by excessive packing on the cylinder. Stock which is dried out along the edges may also cause trouble. Remedial adjustments such as bands, brushes, grippers, guide rests, feed board, emery, and cardboard in the margins and at the guide rest are described. M.W.

PAPER—MERCHANDISING

DAY, FREDERICK T. Paper conversion and usage. No. 27. Paper sampling, collating, dummies, etc. World's Paper Trade Rev. 137, no. 11: 772, 777 (March 13, 1952); *cf.* B.I.P.C. 22: 649.

One of the finest services a papermaker or merchant can offer the printer and converter is a comprehensive range with details of paper samples for quick and easy reference. The latest devices available as aids in the production of sample books are described, including the revolving collating table with double decks, wire stitchers, and tip or edge gummers; roller conveyors may help to speed up the work when large quantities are involved. 1 illustration. E.S.

PAPER—SHEET FORMATION

NORDMAN, LARS, GUSTAFSSON, CHARLEY, and OLOFSSON, GÖRAN. On the strength of bondings in paper. Paper and Timber (Finland) 34, no. 3: 47-52 (March, 1952). [In English] *cf.* B.I.P.C. 21: 546-7.

The strength of the bonds in paper is defined as the irreversible work (I) necessary to decrease the optically measured bonded area by one unit. (I) has been calculated by subjecting paper strips to loading and deloading

cycles (II) and by measuring the area between the ascending and descending sections of the stress-strain curves. The light-scattering coefficient of the strips has been measured before and after each (II), and the increase in the scattering coefficient (which is proportional to the increase in free surface area) is considered to be a measure of the decrease in bonded area. The results indicate that the principle amount of (I) taken up by a paper in (II) is consumed by the breaking of bonds. Sources of error are discussed. The results obtained so far indicate that the strength of the bonds in handmade sheets is fairly independent of the degree of beating of the pulp; however, the strength varies in sheets made from unbleached sulfate and bleached aspen sulfite pulps. 1 table, 6 figures, and 15 references. E.S.

PAPER AND PULP INDUSTRY

AMERICAN PAPER & PULP ASSOCIATION. Planned new paper, pulp capacity. Paper Mill News 75, no. 16: 118-19 (April 19, 1952); *cf.* B.I.P.C. 21: 564.

The future capacity for the total production of paper and board is estimated as follows: 1950—24,480,820 tons; 1951—25,279,225 tons; 1952—26,474,895 tons; 1953—27,167,745 tons. The cumulative increases indicate a rate of increase in wood pulp capacity more than double that in paper and board capacity for 1951 and 1952, which is the result of the large percentage of paper and board capacity increase which will occur in integrated mills and the preponderant increase in the wrapping, specialties, and paperboard grades. Expected capacity increases from 1951 to 1953 by grades of paper and board are also given. 4 tables. M.W.

DOBROW, M. C. The shape of things to come in the paper industry. Am. Paper Merchant 49, no. 4: 14-15, 63 (April, 1952); Paper & Paper Products 93, no. 15: 8-9, 20 (April 20, 1952); *cf.* B.I.P.C. 22: 507-8.

Essentially the same information is given as in the previous reference. M.W.

MANLEY, LEANDER. Review of Western Division. Can. Pulp Paper Ind. 5, no. 4: 70, 72 (April, 1952).

The 1951 production, consumption, and export trends in the pulp and paper industry of British Columbia are reviewed. Diversification and integration of the industry are important factors in the production increases which have occurred for all grades. 5 tables and 1 figure. M.W.

NEUBRECH, W. LEROY. Economic review of the pulpwood, pulp, paper and board industry. Paper Mill News 75, no. 16: 60, 62-4, 66-8, 70, 74, 76, 80-2, 84-5, 88-90, 92, 94 (April 19, 1952); *cf.* B.I.P.C. 21: 635.

The entire quarterly Pulp, Paper and Board Industry Report (annual review) for March, 1952 by the U. S. Dept. of Commerce is reprinted, including all graphs and statistical tabular data. M.W.

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. A report on the American pulp and paper industry. Paper-Maker (London) 123, no. 3: 206-12, 231 (March, 1952); *cf.* B.I.P.C. 22: 508.

Another section of the complete O.E.E.C. report, "The pulp and paper industry in the U.S.A." (*cf.* B.I.P.C. 22: 308-9) is presented; the present

excerpts deal with the pulp- and papermaking centers on the Pacific Coast and in Wisconsin. E.S.

PAPER MILL NEWS. Highlights of the past year. Paper Mill News 75, no. 16: 124, 126, 128, 130 (April 19, 1952); *cf.* B.I.P.C. 21: 635.

Important events in the paper industry during the past year are reviewed. M.W.

STEVENSON, LOUIS T. The place of the United States paper industry in the world economy. Paper Mill News 75, no. 16: 58-9, 132 (April 19, 1952).

The dominant position which is held by the United States in the world pulp and paper industry is shown by the fact that in 1950 the United States made 52% of the total world production of paper, consumed about 62% of it, and imported 59% of the total volume of paper imports. The United States also led in the production, consumption, and importation of pulp. The U. S. paper industry has been, and will continue to be an important factor in creating dollar exchange with foreign countries. However, the changes in the over-all balance of international payments are impossible to forecast. New wood-pulp capacity in North America and an increase in the consumption of domestically produced pulp by European countries may result in a greater interest in export markets by the North American industry. 2 tables. M.W.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. The construction of an educational institution for the new generation of papermakers. Allg. Papier-Rundschau no. 2: 59 (Jan. 29, 1952); Wochbl. Papierfabr. 80, no. 4: 111 (Feb. 29, 1952). [In German]

Reference is made to the educational facilities at the Oskar-von-Miller Polytechnikum in Munich, Germany; the two references are not identical. 8 and 2 illustrations, respectively. E.S.

ANON. A graduate paper school. Pulp & Paper 26, no. 4: 92, 94-5, 107 (April, 1952); Paper Ind. 34, no. 1: 50-1 (April, 1952); Chem. Eng. News 30, no. 14: 1420, 1422 (April 7, 1952).

The Crown Willamette Paper School, conducted for the past 19 years at the Camas mill of Crown Zellerbach Corp., has been designated as a graduate school within the educational structure of Oregon State College. The graduate academic program includes pulp and paper technology and an on-the-job thesis on a plant problem or project, extension courses from the college, and three months' residence and study on the college campus. M.W.

POPP, RUDOLF. Endowment for promoting technical education in papermaking. Allg. Papier-Rundschau no. 5: 205-7 (March 8, 1952). [In German]

The stipulations of the endowment for the department of paper manufacture and conversion at the Oskar-v.-Miller Polytechnikum and some of the facilities are described by the business manager of the executive board. 3 illustrations. E.S.

PAPER AND PULP INDUSTRY—LAWS AND LEGISLATION

PARKER, LEO T. Damage liability in the paper industry. Paper Ind. 34, no. 1: 78-80 (April, 1952).

The author reviews a number of unusual legal cases involving damage liability and the decisions of the courts. E.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

ANON. The Charmin papermakers. Plaskon Mag. no. 10: 7-9 (March, 1952).

The activities of the production, industrial relations, technical, advertising, and sales departments of Hoberg Paper Mills, Inc., Green Bay, Wis. are described briefly. 15 illustrations. M.W.

BERGSTROM, N. H. The community relations program. Paper Mill News 75, no. 8: 114 (Feb. 23, 1952).

The author explains the need for a national organization (the Community Relations Committee of the American Paper and Pulp Association) to coordinate the efforts of individual mills in gaining employee and community understanding and respect. M.W.

PULP & PAPER. Company communications; story of Wisconsin's "workshops." Pulp & Paper 26, no. 4: 40-2, 88, 90 (April, 1952).

Information Service, Wisconsin Paper Industry is an agency which was created by officials of various Wisconsin paper mills for the purpose of helping mills in the establishment of programs designed to educate employees and communities in the policies and practices of the mills. Some of the special programs of different mills are described. 5 illustrations. M.W.

ROCHESTER, DONALD M. Some facts about the community relations program. Paper Trade J. 134, no. 17: 28, 30 (April 25, 1952).

The program of the Community Relations Committee of the American Paper and Pulp Association is described. The Committee was organized to bring about a better understanding of the industry by employees and dependent communities, the general public, and state and nationally constituted authorities, and is following, on a national scale, the work of the Information Service, Wisconsin Paper Industry. M.W.

PAPER AND PULP MILLS

BUCHWALD, E. Provincial Paper Ltd. expands facilities while in production. Paper Trade J. 134, no. 14: 12, 14, 16 (April 4, 1952); *cf.* B.I.P.C. 22: 424.

Essentially the same information is presented as in the previous reference. 5 illustrations. M.W.

CANADIAN PULP AND PAPER INDUSTRY. Elk Falls newsprint plant is nearly completed. Can. Pulp Paper Ind. 5, no. 4: 158-9 (April, 1952); *cf.* B.I.P.C. 21: 180.

The construction of the newsprint mill at Duncan Bay, Vancouver Island, is progressing on schedule, and the mill may go into operation in June, 1952. 5 illustrations. M.W.

PAPER INDUSTRY. Finch, Pruyn installs new fourdrinier. Paper Ind. 34, no. 1: 66-71 (April, 1952); *cf.* B.I.P.C. 22: 112.

The new paper machine, bleach plant, and other items of expansion and modernization of the book-paper mill of Finch, Pruyn & Co. are described. 1 flowsheet and 15 illustrations. E.S.

THOMAS OWEN & Co. (AUSTRALIA) LTD. Making history at the new Burnie paper mill. World's Paper Trade Rev. 137, no. 12: 845-8, 853-4 (March 20, 1952).

An illustrated description of the new vegetable parchment and glassine paper mill at Burnie, Tasmania, on the Emu River is given. It comprises three machines, two of which will make the body paper for the third parchmentizing machine and greaseproof paper which will be converted into glassine on an 18-roll special glassine calender. Slushed eucalyptus pulp will be provided by the mill of Associated Pulp & Paper Manufacturers in the vicinity, an associated company. Eight large beaters, four with steel rolls and four with lava rolls, will also be provided. Details of equipment, acid recovery system, water filtration plant, and effluent disposal are given. The mill is designed for an annual output of approximately 4000 tons of vegetable parchment and 10,000 tons of other papers; it is the first Australian mill to manufacture these specialties. 5 illustrations. E.S.

ANON. Another step forward at Covington. Paper Trade J. 134, no. 15: 12, 14 (April 11, 1952); Southern Pulp Paper Manuf. 134, no. 5: 70, 72, 74, 92 (May, 1952); *cf.* B.I.P.C. 22: 122.

The rehabilitation program of the West Virginia Pulp and Paper Company at the Covington, Va. mill is described. A part of the project has been completed which included the rebuilding of No. 6 and No. 7 paper machines, the remodeling and rearrangement of the stock preparation layout, realignment and modernization of rewinding and roll finishing operations which serve these machines, and the construction of an addition to the machine room. The next improvement which is scheduled is the installation of a new No. 8 paper machine. 4 illustrations in the second reference. M.W.

PULP & PAPER. Progress at Hudson. Pulp & Paper 26, no. 4: 56-7, 59-60, 62 (April, 1952); *cf.* B.I.P.C. 22: 423.

A detailed description is presented of the new features and equipment of the Hudson Pulp & Paper Corp. at Palatka, Fla. 18 illustrations. M.W.

PAPER SIZING

EKWALL, PER. Surface-chemical studies of the reaction between aluminum ions and fatty and rosin acids. Kolloid-Z. 125, no. 3: 129-38 (March, 1952). [In German] *cf.* B.I.P.C. 21: 120.

The properties of monolayers of fatty and rosin acids were studied as a function of pH by means of a surface balance. Extremely stable monolayers of fatty acid are formed over a pH range of approximately 4 to 9 if the fatty acid is incompletely ionized. This behavior is explained on the basis that water is bound between the ionized and nonionized carboxyl groups. On the other hand, rosin acid layers show no such extreme stability, presumably because the carboxyl groups can not approach sufficiently close to form hydrogen bonds in the condensed film. The reaction of the monolayers with aluminum ion was investigated by the same method. The conditions of

reaction depend upon the aluminum concentration and the pH value of the substrate. The reaction between aluminum ions and the surface layers of solid fatty or rosin acids was also studied by means of contact-angle measurements. A maximum contact angle of 92° was obtained for monolayers of the pure acids over the pH range of 1 to 4.9. At higher pH values the contact angle progressively decreased to about 70° at a pH of 9.5. Treatment of the acid monolayer with aluminum ion (2×10^{-4} molar) produces a sharp increase in the contact angle to about 108° over the pH range of 3 to 4. The conditions for maximum contact angle in the case of rosin correspond to those necessary for the formation of dibasic aluminum monorosinate. These same conditions should be expected to produce maximum rosin-sizing effects in papermaking. 12 figures and 18 references. J.W.S.

L. E. Tub sizing today. Allg. Papier-Rundschau no. 6: 276 (March 26, 1952). [In German]

The procedures involved in tub sizing paper with animal size, bone glue in particular, are outlined. Only a few paper types are still sized in this manner, notably drawing papers, banknote paper, document paper, handmade vat paper, etc. The treatment results in improved strength properties, particularly resistance to erasure. E.S.

PAPER SPECIALTIES

GARTE, HANS. Offset print and paper; the demands of the printers to the papermakers. Allg. Papier-Rundschau no. 6: 273-5 (March 26, 1952). [In German]

The following prerequisites of paper and board to be printed by the offset process are listed: The furnish and sizing must be adapted to the peculiarities of offset printing. The surface of the sheets may be rough; however, it should always be well closed and possess a high brightness. The sheets must lie absolutely flat, without curling, waviness, bulging, or other defects and exhibit dimensional stability. With frequent reference to publications of the Lithographic Technical Foundation in the United States, the author discusses ways and means for attaining these goals. 2 references. E.S.

MUNISING PAPER COMPANY, *Chicago*. Tough, new paper introduced for offset. Natl. Lithographer 59, no. 4: 80 (April, 1952).

A new offset paper, Munising A-1090, is described. It is a fiber and plastic combination, has a supercalendered printing surface, and is coated on two sides. It has high tear strength and opacity, will stand immersion in water, and may be printed with conventional inks, although quick-setting inks are recommended to obtain a sharp dot. It has several potential uses, including children's picture books. M.W.

ROSNER, CHARLES. Wrapping papers: a new conception. The Penrose Annual 46: 68-70 + 2 plates and 4 samples (1952).

The author outlines the basic principles in creating, reproducing, and using artistic wrapping papers, such as choosing the motif, animating the motif by creating a pattern with it, varying the pattern by printing it in positive and negative, varying the color of the printing ink, varying the color of the paper itself, creating from corresponding motifs single-color papers which through arrangement and combination can be used as a third wrapping paper, enlarging or reducing the size of the motifs, turning existing motifs around, and creating further variations of the same pattern paper. 2 illustrations and 4 samples. E.S.

WELDON, G. B. The use of gumstrip sealing tape in modern packaging. J. Inst. Packaging no. 11: 11-13; discussion: 13-14 (Exhibition no., 1951).

The techniques of applying gummed tape to both fiberboard containers and bale-type packages in which the contents are simply wrapped in kraft paper and sealed are described, and the advantages of gumstrip sealing are discussed. M.W.

PARANA PINE

RYS, L., ARON, G., and OVERBAECK, W. The influence of chipping on the properties of Paraná pine sulphite pulp. Tappi 35, no. 4: 147-56 (April, 1952).

The loss of the mechanical strength during the drying of sulfite pulp made from Paraná pine and, very likely, from other woods also is caused by mechanical damage which takes place during the chipping. This mechanical damage of the wood structure is the reason for the chemical deterioration of the cellulose fiber during the cooking with sulfite liquor with subsequent easy breakage of the same before and during the mechanical treatment. The pulp made of wood chipped under very mild mechanical conditions has longer fibers, less fines, higher viscosity, higher strength values, and does not suffer loss of strength during the drying when compared with pulp produced from mill-chipped wood. How far this physical superiority is related to chemical values must be further investigated. The higher content of long fibers may be the reason why pulp from hand-chipped wood requires more time for screening. The better quality of fibers from hand-chipped wood is very likely the reason for the longer beating time needed. The improvement of the impregnation period by long soaking, steaming, evacuation, and high initial pressure has a beneficial influence on machine-chipped wood under normal cooking conditions. The best impregnated machine-chipped wood never gives as strong pulp as hand-chipped wood. The hand-chipped wood gives unbeaten and beaten pulp with many more long fibers and less fines than machine-chipped wood. Low-speed chipping gives pulp with still fewer long fibers and more fines than machine-chipped wood. Practical methods should be found to chip wood to prevent mechanical damage to fibers with resultant chemical deterioration during the chemical treatment. The stability of mechanical strength during the drying may be used as a measure for such improvement. The influence of the chipping on the quality of the sulfite pulp must be considered as fundamental, and all pulp investigation and research results without standardization or improvement of the chipping conditions are uncertain. 18 tables, 10 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—GLOSS

ANON. Measurements of the gloss of paper. World's Paper Trade Rev. 137, no. 8: 545-6, 548, 553 (Feb. 21, 1952); *cf.* B.I.P.C. 21: 866.

This is a complete translation of the German article by Ehrhard Liebert in which a photoelectric glossmeter as a control of the smoothness of a running web on a calender is described. 7 figures and 4 footnotes. E.S.

PHYSICAL TESTING—PAPER—MACHINE DIRECTION

INTERNATIONAL PAPER COMPANY. How to determine the grain direction of paper. Inland Printer 129, no. 1: 75 (April, 1952).

The tearing and folding tests for determining grain direction of paper are described. 1 illustration. M.W.

PHYSICAL TESTING—PAPER—OPACITY

CHESTER, C. A. An electronic goniophotometer. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 813-29 (December, 1951).

An instrument is described which provides a great deal of information about the light-reflecting properties of plane surfaces as used in the paper, paint, textile, and similar industries. It presents instantaneously and continuously on the screen of a cathode-ray tube a modified form of polar curve representing the light intensity specularly reflected and scattered at all angles from a plane surface. The curves from two specimens, one of which may be a standard mat white, may be presented simultaneously with their images superimposed for direct comparison. The light intensity at any selected angle may be referred to a vertical intensity scale and a horizontal angular scale attached to the viewing screen. The instrument gives directly the information which can be obtained from a conventional goniophotometer only by plotting on sectional paper the results of many individual, time-consuming determinations. It may be used for the rapid determination of polarizing angles and as a contrast-ratio opacimeter in which the results are presented in the form of complete curves representing the light scattered at all angles when the specimen is backed by a standard black and a standard white. The optical and electrical systems employed are described in detail, as well as the pulse generator used to secure accurate co-ordination between the degree of angular rotation of the specimen and the viewing scale. 1 table and 7 figures. E.S.

PHYSICAL TESTING—PAPER—SHEET-MAKING PROCEDURE

SCHRÖTER, HELMUT. A simple sheet-making apparatus for the practical purposes of a mill laboratory. Wochbl. Papierfabr. 80, no. 5: 143-7 (March 15, 1952). [In German]

A simple, yet reliable sheetmaking apparatus is described which is suitable for small- and medium-sized mills which cannot afford the elaborate Rapid-Köthen standard instrument. 4 tables, 3 figures, and 1 reference. E.S.

PHYSICAL TESTING—WOOD—SAMPLING

STEWART, C. M., FOSTER, D. H., COHEN, W. E., LESLIE, R. T., and WATSON, A. J. Species sampling on a reproducible basis. Tappi 35, no. 4: 129-33 (April, 1952).

The importance of the article lies in pointing out that many wood samples used in chemical investigations and pulping studies are not representative of a species or even of an individual tree. Instructions are given for preparing a reproducible sample of *Eucalyptus regnans* collected from at least 20 trees at random in scattered forests in the state of Victoria, Australia. A composite sample was formed, but the individual samples were also analyzed for cold water extractives, ethanol extractives (at 55°C.), water extractives (at 55°), and successively for chlorine, holocellulose, Klason lignin, pentosans (in extracted wood and in holocellulose), and for methoxyl in holocellulose and lignin. Sulfate pulp yields were determined in all cases. Maximum and minimum and mean percentages, standard deviations, and percentage coefficients of variation are given. The advantages and limitations of using a composite sample are discussed. The authors, after showing the value of

statistical treatment of their data, outline the following general procedure: (1) the selection of a wood sample of each of 10 trees; (2) the determination of the pulp yield in each of the samples, followed by the calculation of the coefficient of variation; (3) the development of a series of theoretical curves from which a first approximation of the total number of trees required for a specific accuracy may be calculated. The original should be consulted for the mathematical treatment, graphs, and tabular data. 3 tables, 3 figures, and 2 references. L.E.W.

PIGMENTS

ANON. Progress of the British Titan Products Company. Paper-Maker (London) 123, no. 3: 201-2 (March, 1952).

Reference is made to the extensions at the Grimsby and Billingham plants of the company, with special mention of the new laboratories at Billingham, including a paper and printing laboratory. The demand for titanium dioxide pigments in the paper industry continues to increase; the company makes Kronos Rutiox CR and anatase pigments for this purpose. 3 illustrations. E.S.

PLASTICIZERS IN PAPER

ANDERSSON, WILHELM. Hygroscopic plasticizers. Svensk Papperstidn. 55, no. 5: 181-3 (March 15, 1952). [In Swedish]

The basic principles of the action of plasticizers in paper, cellophane, tobacco, animal size, candy, etc. are outlined. Glycerin is the best humectant known, but its high price makes it too expensive for low-cost, mass-production articles, like paper. The suitability of invert sirup for this purpose is discussed, with reference to the data by Cleland and Fetzer (*cf.* B.I.P.C. 14: 383). 2 tables and 1 reference. E.S.

PLASTICS

THAYER, GORDON B. Plastics literature references, selected for the mechanical engineer—July, 1950 through June, 1951. Mech. Eng. 74, no. 4: 309-11 (April, 1952); *cf.* B.I.P.C. 21: 574.

A selected list of references, including paper laminates and reinforced plastics, is presented. 117 references. E.S.

PLASTICS—PAPER-BASE

ANON. Fabrication of decorative laminates. Brit. Plastics 25, no. 274: 90-5 (March, 1952).

Some common fabricating techniques (circular-, band-, and hand-sawing, drilling and countersinking, spindle-molding and routing, and disk- and hole-cutting) and methods of veneering the material and using it for applications such as table tops are described. 19 illustrations. M.W.

PLASTICS—TESTING

DECROES, G. C., and TAMBLYN, J. W. Protection of cellulose esters against breakdown by heat and light. Modern Plastics 29, no. 8: 127-8, 130, 132, 134, 136, 185-9 (April, 1952).

Thermal breakdown, natural weathering, and accelerated weathering tests were conducted to investigate the degradation of cellulose ester plastic systems from the effects of excessive heat and ultraviolet light. Many plasticizers

which contain methylene or methylidyne groups were found to be susceptible to oxidation at 150°C. and thereby induced chain-length breakdown in cellulose esters. Antioxidants inhibited this type of degradation; heavy-metal soaps and titanium dioxide catalyzed it. In systems which contained an oxidation-resistant plasticizer a similar breakdown could be produced by the addition of a peroxide. Severe thermal breakdown was caused by traces of strong mineral acid or by certain ferric salts. The former type could be prevented by the addition of acid acceptors, the latter by metal deactivators. In the process of breakdown by ultraviolet light, oxygen also was observed to play an important part. Oxidative degradation induced by the presence of autoxidizable plasticizers contributes to this type of breakdown, although to a lesser extent than to breakdown by heat. Ultraviolet breakdown inhibitors are discussed, and it is shown that the antioxidants are useful only if combined with an additive which filters out the ultraviolet efficiently. In studies of weathering inhibitors, the thickness of the test piece is an important variable. The kinetics of breakdown by heat and light are shown to be consistent with the theory that breakage of chain links is a random process in both thermal and ultraviolet degradation. 19 tables, 7 figures, and 35 references. M.W.

POWER

WESTERBERG, MATTS O. The consumption of fuel and electric power in the Swedish sulfite mills. Norsk Skogind. 6, no. 3: 69-75 (March, 1952). [In Swedish; English summary]

The results obtained in a study of the fuel and electric-power consumption in the Swedish sulfite industry during the period July, 1945 to June, 1948 are discussed. The study covered 26 sulfite mills; those with an annual output of less than 10,000 tons were not included. Unbleached pulp was used as the standard, and the output of mills producing higher-quality pulps was converted to unbleached pulp. The different kinds of fuel were calculated as units of coal of standard quality. It has been postulated that the consumption of fuel and electric power increases nearly proportionally to the increase in production; the present investigation has verified this assumption. It has also been assumed that there is a certain shutdown consumption when the mills are ready for production but not in operation and an additional consumption when the operations start; this has also been verified. As an average, the fuel consumption amounted to 0.4 ton of coal/ton of pulp; the highest and lowest figures were 0.7 and 0.3 ton of coal, respectively. The average consumption of electric power was 400 kw.-hr./ton of pulp; the maximum and minimum figures were 500 and 200 kw.-hr./ton, respectively. The average consumption of electric power per month amounted to 400,000 kw.-hr. + 240 kw.-hr./ton of pulp; the variations in the first figure are very great. The second figure varies between 120 and 340 kw.-hr./ton of pulp. Attention is drawn to the fact that the mills could not always supply exact data, particularly in the case of fuel consumption, so that the accuracy of the final results of this investigation is not as high as desired. By improved bookkeeping procedures it should not be impossible to obtain better results in future studies. A similar investigation of the fuel and electric-power consumption in the mills of other countries would be of great interest. 11 figures. E.S.

POWER, HYDRO-ELECTRIC

MCKEACHIE, J. G. Power for pulp. Can. Pulp Paper Ind. 5, no. 4: 140, 142 (April, 1952).

Several industrial developments, including the sulfate mill of MacMillan

& Bloedel Ltd., and the newsprint mill of Elk Falls Co. Ltd. were made possible by the British Columbia Power Commission's development at Campbell River on Vancouver Island. 2 illustrations. M.W.

PRINTING AND PRINTER'S INK

BRAZNELL, JOHN C. Ink and paper. Share Your Knowledge Rev. 33, no. 7: 7-8 (April, 1952).

The author discusses the difference in formulation of inks for hard and soft coated papers. M.W.

DAY, FREDERICK T. Paper conversion and usage. No. 28. Wallpaper printing. World's Paper Trade Rev. 137, no. 14: 980, 983-4 (April 3, 1952); *cf.* B.I.P.C. 22: 677.

Following a brief description of the requirements of the body paper for printing from handmade blocks or by machine, the author discusses the preparation of printing blocks or rollers, the transfer of the pattern to the block or roller (an operation known as "putting on") followed by cutting, and the use of engraved rollers, frequently in conjunction with surface rollers. 2 illustrations. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 29. Papers for booklets, broadsheets and printing for direct mail. World's Paper Trade Rev. 137, no. 15: 1082, 1087 (April 10, 1952).

The different printing processes for sales promotion matter and suitable papers for the job are discussed. E.S.

FLINTKOTE COMPANY, *Los Angeles.* Spotting-up time cut in half. Boxboard Containers 70, no. 712: 17, 19 (April, 1952).

Make-ready spotting-up time for printing folding cartons has been reduced by 50% through the use of a type 26 Spherekote-brand drawsheet placed over the hard packing and under the top sheet. The drawsheet consists of a rubber sheeting which absorbs the shock of printing and which is coated with microscopic glass beads that insure a sharp impression with a minimum of ink. 2 illustrations. M.W.

SIMMONS, ROBERT H. Developments in the graphic arts for 1951. Tappi 35, no. 4: 32A, 34A, 36A, 38A, 40A, 42A, 44A, 46A, 48A, 50A (April, 1952); *cf.* B.I.P.C. 21: 341.

Developments in the graphic arts during the year 1951 are reviewed under the headings: paper, printing inks, drying of inks, color and photography, lithography, typographic printing, silk screen, miscellaneous duplicating methods, bindery operations, and miscellaneous. 28 references. E.S.

PRINTING AND PRINTER'S INK—ANILINE PROCESS

DICK, FRANK A. Aniline printing in carton industry. Paper Trade J. 134, no. 11: 30; discussion: 30, 32 (March 14, 1952); Tappi 35, no. 4: 112-13A; discussion: 113A (April, 1952); Fibre Containers 37, no. 5: 110 (May, 1952). [Abridgments]

The process, inks, and presses used in aniline printing, and the advantage and limitations of the process are described briefly. The present handicaps are those of the rubber printing plates. Gloss cannot be obtained on carton

folding stock; however, a coat of gloss varnish can be applied in the same operation with the printing process at a definitely lower cost than with letterpress printing or other varnishing methods. E.S.

PRODUCTIVITY

PIRIE, G. W. Payment by results in the papermill. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 831-47; discussion: 848-53 (December, 1951).

The author discusses the various schemes of payment with special reference to their effect on productivity. An introduction to work study is given, and the measurement of the work unit is described, together with its application to incentive schemes. Work study makes possible the accurate measurement of the amount of work in any job in absolute units. It provides management with data for improved planning, programming, and costing, as well as forming the basis for a fair bonus scheme. The history and effects of these incentives are discussed, particularly as applied to paper mills. The principles have been employed by several paper mills in Great Britain, and productivity has been raised to a significant extent, usually offering the opportunity for higher earnings than before. 2 figures. E.S.

PYRITES

BROMAN, LENNART. The roasting of pyrites in the Nichols-Freeman flash roaster. Norsk Skogind. 6, no. 2: 54-6 (February, 1952). [In Norwegian; English summary]

The principles of the Nichols-Freeman flash roaster, its operation and maintenance, and the economics of the process are discussed (*cf.* B.I.P.C. 5: 187). 1 table and 2 figures. E.S.

FIEDLER, HEINZ. A new method for the roasting of pyrites. Wochbl. Papierfabr. 80, no. 6: 175-7 (March 31, 1952). [In German]

The Dorr FluoSolids reactor is described (*cf.* B.I.P.C. 21: 870). 1 diagram and 4 references. E.S.

RADIOACTIVITY

ATTWOOD, B. W. Some experimental work on the response of the beta ray substance gauge. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 771-82; discussion: 783-8 (December, 1951).

An experimental study has been made of the results given by a beta-ray substance gage in measuring the basis weights of a range of sheet materials of different compositions. The range of basis weights examined (140-720 lb./500 sheets, 30 × 40 in.) corresponds to that of light boxboards. The following results were obtained: A wide range of uncoated boxboards gave consistent results of fair accuracy; the standard deviation was about 3 lb./500 sheets of the given size. The examination of metallic and plastic sheets and foils showed clearly that the result given by the gage is very dependent upon the atomic weight of the material measured, particularly for the higher atomic weights; for example, lead foil shows nearly twice its true basis weight when compared with boxboard or with aluminum foil. As a consequence, enamel-coated boards containing heavy atoms, such as barium and to a lesser extent, aluminum and silicon (from china clay), show high readings when compared with uncoated boards composed princi-

pally of the light atoms, carbon, hydrogen, and oxygen. Moisture gives almost exactly the same response as uncoated board and a range of pulps and plastics composed of carbon, hydrogen, and oxygen. 5 tables and 6 figures. E.S.

BRADFORD, E. A. Practical considerations in the use of a commercial beta ray substance gauge. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 3: 855-74 (December, 1951).

An external reference beta-ray substance gage made by Isotope Developments Ltd. is described, including the experiments performed to calibrate the instrument and assess the importance of certain variables. A later modification, the so-called internal reference gage, is also described; similar trials have also been performed with this instrument. The results are discussed and analyzed statistically to determine the usefulness and precision of the instruments on the paper machine. Sufficient theoretical data are included to make possible the best use of the practical findings. A number of sources of error in the determination of basis weight have been identified and recommendations are given for reducing their incidence to a minimum (stabilization of the gap distance to within 0.1% and a method for correction for the decay of the sources). The minimum error is in the region of $\pm 2\%$ of the substance being measured, provided that careful readings are taken. The reported results are sufficiently favorable to justify the application of these instruments to any machine where the closer control of basis weight may lead to savings of money or raw materials by the reduction of broke and overweight paper, in addition to the advantage of ensuring a more standard product. 3 tables, 7 figures, and 3 references. E.S.

ISOTOPE DEVELOPMENTS LIMITED. The Package Monitor. Brit. Packer 14, no. 3: 34-5 (March, 1952).

A device, called the Package Monitor, for checking the contents of sealed packages consists of a beta-ray emitter and a detector tube and functions on a principle opposite to that of the electric eye. The radiation source and the detector tube are set up on either side of a conveyor, and the articles to be tested permit a certain amount of radiation to pass through. The detector tube is adjusted to accept a limited degree of radiation and will respond to variations in either direction and set off a warning signal. The device can check containers which are either filled or empty or in which there is a deficiency of content, containers which are to be filled to a predetermined level, or containers which should hold a predetermined number of items. 2 figures and 2 references. M.W.

RAW MATERIALS—NON-FIBROUS

POOR, E. N. TAPPI nonfibrous raw materials report—1951. Tappi 35, no. 4: 20A, 22A, 24A, 26A, 28A, 30A (April, 1952); *cf.* B.I.P.C. 21: 419.

Information on the availability, price trends, uses and substitutes, and outlook for 1952 is presented for the following chemicals and nonfibrous raw materials used in the pulp and paper industry: sulfur, soda ash, lime, caustic soda, chlorine, peroxides, sulfur dioxide, rosin, casein, glue, starch, enzymes, alum, clay, titanium pigments, zinc sulfide pigments, dyestuffs, synthetic resins, bactericides, plasticizers, and wax. 2 tables. E.S.

RAYON—VISCOSE PROCESS

SIMMONDS, F. A., and KINGSBURY, R. M. Viscose-rayon pulps from Chilean hardwoods—coigue, tepa, and ulmo. Tappi 35, no. 4:

166-74 (April, 1952); U. S. Dept. Agr., Forest Service, Forests Products Lab. Rept. no. R1906 (September, 1951). 23 p.

A study was made of the possibility of producing pulp of viscose-rayon grade from three Chilean hardwoods—coigue, tepa, and ulmo. Unbleached pulps were made from the three woods by: (1) the neutral sulfite semi-chemical process with and without steam hydrolysis, (2) a water pre-hydrolysis-sulfate process, and (3) the sulfite process. These pulps were purified by means of the conventional sequence of chlorination, alkaline extraction, oxidation, and acidic extraction. The yields of purified pulps, which contained from 2 to 7.5% of pentosans, ranged from 38 to 45% of the woods. The results of filterability tests of viscose solutions from two of the pulps, of spinning trials on four of the pulps, and the general similarity of all the pulps in chemical composition indicated that pulps acceptable for continuous-thread viscose rayon can be produced from the three woods by any of the processes investigated. 6 tables and 36 references. E.S.

TENGQUIST, EBBE. Which demands must be placed upon viscose pulp for slurry mercerization? Svensk Papperstidn. 55, no. 5: 176-8 (March 15, 1952). [In Swedish; German and English summaries]

Until now most pulp mills produced dissolving pulps for viscose manufacture with properties adjusted for the batch steeping of pulp sheets. Continuous or slurry mercerization will probably require different physical properties of the dissolving pulp; the purpose of the present study was the investigation of one of these properties. The Swedish rayon mill with which the author is connected has two slurry-mercerization machines (constructed by Improved Paper Machinery Corp., Nashua, N.H.) in operation. It has been observed that the removal of the steeping liquor from the pulp slurry by pressing does not always proceed in the same manner with different pulps. One of the reasons was found to be the so-called "zero-fiber" content (finest fraction or mucilage) (I) of the pulp; this was determined with an H.S. fiber classifier (*cf.* Sieber, R. Die chemisch-technischen Untersuchungs-Methoden der Zellstoff- und Papier-Industrie, 2d ed., Berlin, Springer, 1951, p. 518-19). Pulps with a high (I) were more difficult to press after mercerization, and the output of the slurry machine decreased appreciably. The liquor removed by pressing was found to contain a large amount of fibers. These were filtered and subjected to fractionation after neutralization and washing. A distinct relationship between (I) and the efficiency of the machine could be established. Slurry mercerization will in all probability replace the sheet-steeping process in the near future. It is therefore essential that the pulp mills produce a dissolving pulp with suitable properties for this new method. 3 tables, 1 figure, and 2 references. E.S.

RESEARCH LABORATORIES

ANON. Progress of the Pulp and Paper Research Institute of Canada. Can. Pulp Paper Ind. 5, no. 4: 20-1, 23-4, 28 (April, 1952); *cf.* B.I.P.C. 22: 522.

The expansion and improvement of the research and educational facilities at the Institute and some of the research projects which were initiated during 1951 are described. 5 illustrations. M.W.

SAFETY

SCHOENER, J. G., JR. Training and safety—a point of view in one industry. Paper Trade J. 134, no. 15: 26-8 (April 11, 1952).

The employee training and safety program of the New York Telephone Co. is described. M.W.

SOUGHTON, F. O. Quality production with safety . . . a proven reality at Terrace Bay. Pulp Paper Mag. Can. 53, no. 4: 84-9 (March, 1952); *cf.* B.I.P.C. 22: 523.

The safety program of the LongLac Pulp and Paper Co., Ltd. is described in detail. 7 illustrations. M.W.

SALESMEN AND SALESMANSHIP

LAPP, C. L. Customer gripes lose sales. Pulp Paper Mag. Can. 53, no. 4: 94 (March, 1952).

An informal survey among customers revealed the following complaints about paper salesmen: unfairness in the allocation of scarce papers and paper products; unreliability in presenting information about merchandise shortages, availability, and price changes; excessive time consumption in making a sale; lack of customer interest and of product information; unreliability as a source of paper products; and "high-pressure" methods of selling. M.W.

SEMI-CHEMICAL PULPING PROCESS

CANADIAN PULP AND PAPER INDUSTRY. Bathurst's hardwood semi-chemical mill. Can. Pulp Paper Ind. 5, no. 4: 148-50, 152, 154, 156 (April, 1952); *cf.* B.I.P.C. 21: 802.

The semichemical pulping operation which is carried out by the Bathurst Power & Paper Company is described. During the first year of operation quality and yield of pulp came up to expectations, and two process changes were effected: sulfate cooking liquor was replaced by pure caustic liquor and pulp washing was eliminated. 14 illustrations and 1 flow diagram. M.W.

SETUP BOXES

FRA. Calculations for cardboard boxes. (XIV). Allg. Papier-Rundschau no. 5: 215-17 (March 8, 1952). [In German] *cf.* B.I.P.C. 22: 609-10.

A sample calculation is given of the cost (in Germany) of a simple upright shoulder box for pharmaceutical purposes with a slide-on, separate lid. 1 illustration and 2 tables. E.S.

SHIPPING CONTAINERS—EXPORT PACKAGING

GROUT, R. G. A shipowner's thoughts on packaging. J. Inst. Packaging no. 11: 20-2; discussion: 23-5 (Exhibition no., 1951).

The author presents several recommendations for packaging cargo for export shipment and expresses the opinion that fiberboard or cardboard containers are suitable packaging media for many commodities. M.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. March of multiwalls. Chem. Week 70, no. 18: 39-40 (May 3, 1952).

In 1951 the chemical industry consumed about one fifth of all multiwall bags sold. They are being used for packaging a wide variety of chemicals for which they are custom-made from high-finish sheets, high-density

sheets, high-wet strength papers, clay-coated papers, and laminated glassine papers. They offer the advantages of economy, cleanliness, and adaptability to automatic weighing and packaging techniques; only where weight and salvage value are important considerations are they inferior to steel or fiber drums and fabric bags. 1 illustration. M.W.

SHIPPING CONTAINERS—TESTING

GENERAL BOX COMPANY, *Des Plaines, Ill.* General Box opens testing lab. Packaging Parade 20, no. 231: 82 (April, 1952); Fibre Containers 37, no. 4: 66 (April, 1952).

The new laboratory and its testing facilities are described briefly. 3 illustrations. M.W.

GRETZ, JOHN L. Engineering a cushioned package. Modern Packaging 25, no. 8: 129-33 (April, 1952); *cf.* B.I.P.C. 17: 151.

Methods for calculating the protection a product requires by expressing its over-all strength in terms of a G-factor (the maximum deceleration which a product can sustain without damage) and for determining the load-compression characteristics of a cushioning material, including compression, set and recovery, energy storage, and efficiency, are described. 14 figures. M.W.

PAINE, F. A. Package testing. J. Inst. Packaging 2, no. 13: 10-13, 16 (3rd quarter, 1951).

Mechanical tests of complete packages, tests for strength of materials, tests for moisture, moisture vapor and gas resistance, and mold- and insect-resistance tests are described. 3 tables. M.W.

SLIME PREVENTION

MARDON, J., and PEDDER, D. Slime control in a tissue mill; distribution of phenyl mercuric acetate in a closed paper-mill white-water system and its effect on the microflora. Pulp Paper Mag. Can. 53, no. 4: 122-8 (March, 1952).

Phenylmercuric acetate (I) was used in shock doses in a British mill to control slime which consisted of a filamentous fungal mat in which bacteria and yeasts were entangled. The quantities of mercury in the system were determined by chemical and microbiological methods; the microbiological assays gave much lower figures than the chemical methods, but the same trend was followed throughout. (I) was found to distribute itself between water and fiber in a ratio of about 5:3. A considerable portion of (I) circulates with white water fines and is biologically inactive. Microbiological examinations at various points of the system showed a change of microflora corresponding to the increase and decrease of biologically active mercury. (I) in doses of 6 oz./2000 lb. of pulp for approximately every 40 tons of machine production showed high fungicidal properties and acted as a bacteriostatic compound. Since such great adsorption of (I) on the fibers occurs, the slimicide will not penetrate to all parts of the system in sufficient concentration. Under such conditions, frequent dosages of one slimicide combined with shock doses of another (of a different type) will probably be preferable. The highest concentration of mercury reached in the finished paper was 15 p.p.m.; of this amount, only 0.5 p.p.m. was biologically active. Five hours after dosage there was no detectable mercury in the paper. The experimental techniques are described in eight appendixes. 8 tables and 18 references. E.S.

SPECIFICATIONS

ANON. Basic military packaging requirements. Paper Sales 12, no. 4: 15, 45-6 (April, 1952).

The packaging procedures which are described under specifications JAN-P-116 are outlined. 1 illustration. M.W.

SPONGES, ARTIFICIAL

ANON. Thirsty, for profit. Chem. Week 70, no. 15: 39-40, 42 (April 12, 1952).

The synthetic sponge industry has plans for a 50-100% expansion of facilities for the coming year. Both O-Cell-O and DuPont, which share an estimated 90% of the annual volume of business, as well as several other companies, are constructing new facilities. Several new household applications will consume the increased production. Cellulose-sponge yarn which is manufactured by DuPont is a new form of the synthetic which is produced as a continuous length of ball warp with a cotton yarn center. It is used in various types of mops and car-washing mits. Sponges are made from viscose to which vegetable fibers are added for strength along with salt crystals. A cooking procedure hardens the cellulose structure, and the pores are formed as the mixed crystals dissolve and drain from the molds. 1 illustration. M.W.

STAINS AND STAINING

"ANION." A chemist's notebook. Paper-Maker (London) 123, no. 2: 116 (February, 1952).

Although the author believes that in an investigation on the most popular staining method for fiber identification, the Herzberg stain would score an easy victory, he personally prefers Graff's C stain to any other, even though some practice is essential in its use. For the preparation of permanent slides for reference purposes, the author has obtained excellent results with Chlorazol black E and D.P.X. Mountant. E.S.

STATISTICAL METHODS

MACAULAY, DONALD. Quality control in printing production. Am. Printer 133, no. 4: 25-7, 68, 70-1 (April, 1952).

Statistical quality control is defined, and its functioning in the mass production of a wide variety of printed pieces is explained, with examples including paper weight evaluation from different mills, the maintenance of opacity standards, and gloss readings to evaluate the finish of the paper for determining its uniformity with regard to halftone printing. Through the use of a quality-control program, the level of quality is raised, and the volume of spoilage and rejections is greatly diminished. 5 figures. M.W.

STEAM POWER

MYERS, DAVID MOFFAT. How taxes affect mill improvements. Paper Ind. 34, no. 1: 81 (April, 1952); *cf.* B.I.P.C. 22: 612.

A chart is provided which shows the trends of sales and production expenses, taxes, and profits for the past five quarters in relation to total sales and other income for corporations of all asset sizes; during this period, profits have dropped from 7.62 to 4.65% of total income, and the present trend continues downward. On the basis of these figures, calculations are presented which show that $1000 spent on sales and production result in

much lower retainable profits than the same amount expended on power improvements. These facts warrant special studies of all possibilities in the field of improved efficiency which are likely to bring a higher net return than equal sums spent for increased sales and production. When the business cycle reflects a downward trend, the importance of this policy is further augmented. 1 graph. E.S.

STREAM POLLUTION

MOGGIO, W. A. Experimental chemical treatments for kraft mill wastes. Tappi 35, no. 4: 150-1A (April, 1952).

The experimental chemical processes for the treatment of kraft mill wastes for the removal of color and oxygen-consuming materials are reviewed. The greatest disadvantage of all processes to date has been the excessive cost of treatment coupled with the problem of handling and disposal of large quantities of sludge produced. This probably accounts for the fact that none of the processes, with one exception, have gone beyond the laboratory stage. A chemical-treatment process at present under study and development is described. It involves the use of excess lime and carbonation followed by the recovery of the lime in the precipitated sludge. With the recovery of the chemicals this process shows promise for a successful economic application. The development of an easily dewatered sludge and control methods is considered essential to success. 1 table. E.S.

RUDOLFS, WILLEM, and NEMEROW, N. L. Rag, rope, and jute wastes from specialty paper mills. I. Physical and chemical wastes. Sewage Ind. Wastes 24, no. 4: 480-4 (April, 1952).

A study of wastes from specialty paper mills which utilize jute, rag, and rope as stock shows that the beater wash water as well as the very alkaline and highly pollutional cooking liquor must be considered. The total volume of discharged cooking liquors and wash waters averages 73,000 gal., and contains approximately 750 lb. of B.O.D. and 2000 lb. of total solids per ton of paper produced. A proximate analysis of the organic constituents showed the presence of lignins, volatile acids, polysaccharides, greases, proteins, and hemicelluloses. There was a general relationship between total alkalinity, B.O.D., and total solids in the cooking liquors. With the exception of rag beater wash water, the wastes did not contain sufficient organic nitrogen to support adequate biological life in a treatment process. 5 tables and 2 references. M.W.

SYLVESTER, ROBERT O. Pulp mill location study in regard to water pollution. Sewage Ind. Wastes 24, no. 4: 508-21 (April, 1952).

A survey and study is presented of the Willapa River estuarial area in southwestern Washington (perhaps the best oyster-producing area on the West Coast) which was made for the purpose of determining: (1) the feasibility of discharging waste water from a proposed kraft-type pulp mill into the Willapa River estuary; (2) the most suitable point of discharge for this waste liquor; and, (3) the existing condition of the estuary as affected by raw discharge from two cities and by decomposing wood wastes from several sawmills. 2 tables, 10 figures, and 10 references. M.W.

SULFITE MILLS

IRVING PULP AND PAPER LTD. New sulphite and kraft pulp mill. Pulp Paper Mag. Can. 53, no. 4: 90 (March, 1952).

The 50-year-old sulfite pulp mill at Reversing Falls on the Saint John River in New Brunswick is being completely rebuilt by Irving, successor company of Saint John Sulphite Ltd., and a bleached kraft mill is also being erected on the premises. The new mill will have a daily capacity of 200 tons of sulfite and 250 tons of kraft pulp. A modern high-pressure steam power plant will ultimately have an electrical generating capacity of 22,000 kw. as a by-product from process steam. 1 illustration. M.W.

SULFITE PROCESS

HÄGGLUND, ERIK, and STOCKMAN, L. Recent investigations concerning sulphite pulping. Paper Mill News 75, no. 12: 44-6, 48 (March 22, 1952).

The work on sulfite cooking with recycling of waste liquor (*cf.* B.I.P.C. 21: 732-3) and on the influence of formic acid (*cf.* B.I.P.C. 22: 205) is discussed. 4 tables and 6 figures. E.S.

TOKIWA, Y., and HOMMA, K. Distribution of degree of polymerization of cellulose in sulfite pulping. J. Japan. Tech. Assoc. Pulp Paper Ind. 6, no. 1: 13-22, 91 (February, 1952). [In Japanese; English summary]

A study was made of the D.P. of cellulose from sprucewood and of the distribution of the D.P. of cellulose in sulfite pulping. It was found that the D.P. of holocellulose obtained by the sulfite delignification of sprucewood was higher than that produced by other methods. 12 tables, 6 figures, and 11 references. E.G.S.

SULFITE WASTE LIQUOR

BAUM, MARTIN, LOVIN, ROBERT, and SALVESEN, J. RICHTER. Recent findings on tanning properties of lignosulfonates. J. Am. Leather Chemists Assoc. 47, no. 4: 269-78; discussion: 278-80 (April, 1952).

Laboratory investigations which were carried out to establish the mechanism of tanning with lignosulfonates (I) prepared by fractional precipitation from spent sulfite liquor show that the sulfonic groups in (I) combine with the protein in the hide. The degree of sulfonation, the molecular weight of (I), and the pH determine the amount and firmness with which they combine. Under normal tanning conditions, at a pH of 3-4.5, a 25 to 30-degree tannage is obtainable with fractionated (I). With (I) from untreated spent sulfite liquor a degree of tannage of 12-17 is obtained. The procedures for using (I) to the best advantage were also determined, and it was found that larger amounts of (I) can be used if applied as a pretan, followed by a vegetable retan. This method produces a leather with normal physical properties. Chrome-tanned leather can be retanned with (I) either alone or in a blend with vegetable tans. 7 tables, 1 figure, and 2 references. M.W.

SORENSON, H. A. Burning waste sulphite liquor may solve disposal problem. Can. Chem. Processing 36, no. 4: 36 (April, 1952); Chem. Eng. News 30, no. 14: 1410 (April 7, 1952); Paper Ind. 34, no. 1: 46, 48 (April, 1952); Mech. Eng. 74, no. 5: 410-11 (May, 1952). [Abridgments]

A method for burning calcium-base spent sulfite liquor without the use of auxiliary fuels is described. Stable combustion of the liquor was maintained in a preheated refractory-lined furnace by using spent sulfite liquor which was preheated by a steam coil in the bottom of the storage barrel; a conventional-

type oil burner with steam-atomizing nozzle was installed for firing the liquor, and compressed air, instead of steam, was supplied as the atomizing medium. A combustion efficiency of 76% was obtained which could be substantially improved by redesigning the furnace. M.W.

SULFITE WASTE LIQUOR—AMMONIA BASE

CROWN ZELLERBACH CORPORATION. Add waste utilization. Chem. Week 70, no. 15: 34 (April 12, 1952); Chem. Eng. 59, no. 5: 230-1 (May, 1952).

A new product which is obtained from ammonia-base sulfite liquor is being manufactured for use as an adhesive, wetting agent, dispersant, soil conditioner, yeast nutrient, and chemical raw material. Trade-named Orzan, the product is essentially ammonium lignosulfonate and wood sugar. M.W.

SULFUR

ANON. A critical year for sulphur. Can. Pulp Paper Ind. 5, no. 4: 30, 34 (April, 1952).

The sulfur situation with respect to Canadian industry is discussed, and some of the measures which are being undertaken to correct the current shortage are outlined. 2 illustrations. M.W.

CANADIAN INDUSTRIES LIMITED. Liquid sulfur for sulfite mills. Can. Chem. Processing 36, no. 3: 54, 56-7 (March, 1952); Can. Pulp Paper Ind. 5, no. 5: 10-11 (May, 1952); Chem. Eng. 59, no. 5: 252 (May, 1952).

The manufacturing process which will be used in a new plant for the manufacture of liquid sulfur dioxide from smelter gases at Copper Cliff, Ont. is described. The plant is scheduled to begin operation in the fall of 1952 and will produce 90,000 tons of liquid sulfur dioxide annually, most of which will be consumed by sulfite mills. 2 figures. M.W.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Waste Committee.* Sulphur losses from sulphite mills. Pulp Paper Mag. Can. 53, no. 4: 116-18 (March, 1952).

Sulfur losses ranging from 200 to 255 lb./ton at the acid towers, in blowpit stacks, and in the spent liquor reported by eight Canadian mills were examined from the point of view of possible recovery methods. The following conclusions are drawn from the rather incomplete information gathered to date: Adequate capacity and careful control will insure negligible losses at the towers. It is practicable to recover roughly 10% of the sulfur by a recovery system at the blowpit stacks. Sulfur is only recoverable at present from the spent liquor by steam stripping; this represents about 10 lb./ton of pulp and is accomplished at a high cost. 1 table and 1 reference. E.S.

JOHNSTONE, H. F. Recovery of sulphur dioxide from dilute gases. Pulp Paper Mag. Can. 53, no. 4: 104-12 (March, 1952); Paper Trade J. 134, no. 21: 24, 26, 30, 32, 36, 39 (May 23, 1952).

The possibilities of recovering sulfur dioxide from dilute waste gases are reviewed from the standpoint of providing an additional source of the gas for use in pulp mills. The equilibrium vapor pressures over solutions of the ammonia-sulfur dioxide-water system indicate that solutions of ammonium sulfite-bisulfite may be used to recover the gas with good efficiency and without serious loss of ammonia even if the concentration of the original gas is as low as 0.4%. Some modification of the process used at the Trail smelter appears to be the most economical. About half of the sulfur dioxide recovered

must be converted into ammonium sulfate, and the other half may be used as a concentrated gas for the preparation of cooking liquor or other purposes. The value of the ammonium sulfate as fertilizer is greater than the combined value of the sulfur and ammonia. The equipment used in the process is relatively simple; estimates have indicated that, even with dilute gases, recovery can be made at a cost less than the value of the sulfur. The recovery of sulfur dioxide from stack gases from the combustion of coal by treatment with lime and limestone slurry is considered. Impurities from the dust collected in the absorber and the formation of sulfate are expected to cause difficulties in making cooking liquor from this source. A flowsheet is suggested for a possible process using ammonia solutions for the absorption of the sulfur dioxide followed by precipitation of calcium sulfite which is sent to the acid tower. Impurities are removed in a side stream which is treated with sulfuric acid to produce impure ammonium sulfate and concentrated sulfur dioxide which may be utilized to make a stronger cooking liquor. In this way, approximately 50% of the sulfur required in the process may be recovered from stack gases. 9 figures and 12 references. E.S.

MITCHELL, E. R. The importance of recovering sulphur from industrial power plant flue gases. Pulp Paper Mag. Can. 53, no. 4: 113-15 (March, 1952).

The author discusses the sulfur content in the coals used in the different provinces of Canada. The low-sulfur coals burned by the western pulp and paper mill power plants do not offer a potential source for recovery, whereas Ontario and Quebec burn coal with an approximate average sulfur content of 2.5%, and their mills have about one third of their sulfur requirements available in their flue gases. New Brunswick coal averages about 7.2% and Nova Scotia coal 3% sulfur; hence, the plants in the eastern Canadian provinces should have from 70 to 125% of their sulfur requirements available in their flue gases. 1 table and 6 references. E.S.

ROYALITE OIL COMPANY, LIMITED, *Calgary, Alberta.* New sulfur recovery plant. Can. Chem. Processing 36, no. 3: 59-60 (March, 1952).

Construction of a plant for producing elemental sulfur from hydrogen sulfide which is absorbed from natural gas is being planned. Production is expected to total 30 long tons daily. 2 illustrations. M.W.

TENSION WOOD

TERRELL, BESSIE Z. Distribution of tension wood and its relation to longitudinal shrinkage in aspen. U. S. Dept. Agr., Forest Service, Forest Products Lab. Rept. no. R1917 (February, 1952). 7 p. + 9 plates.

The distribution of tension wood, an abnormal type of wood characterized by the presence of gelatinous fibers, was determined with respect to the upper, lower, and lateral sides of aspen (*Populus tremuloides*) logs from leaning trees; the relationship of longitudinal shrinkage (I) to the comparative number of gelatinous fibers and specific gravity also was determined. (I) was found to be related to the comparative number of gelatinous fibers. The combined factors of (I) and specific gravity jointly affect the longitudinal shrinkage of aspen, i.e., the percentage of (I) is greatest in specimens which have the largest values for specific gravity and the largest number of gelatinous fibers with relatively thick cell walls. The determination of the combined functions of three variables is considered a valuable tool for determining the relations between anatomical features and properties of wood; however, the small number of specimens investigated did not permit

the calculation of a mathematical equation expressing the three-dimensional relationship of these factors. 1 table, 9 figures, and 6 references. E.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

SOCIETY OF PLASTICS INDUSTRY, INC. Produces consistent results in testing sheet material for flammability. Chem. Processing 15, no. 3: 106 (March, 1952).

The SPI flammability tester for plastics, textiles, paper, rubber, and other material in sheets from 0.001 to 0.25 inch in thickness consists of a sturdy cabinet which houses inclined tracks upon which the sample holders slide and carry the sample into the controlled flame. Three instruments make the necessary readings: one clock measures the time needed to ignite the sample and another the burning rate, and a thermocouple gives an indication of flame temperature. A manometer is used for regulating the gas pressure to the igniting flame. Brief directions for the use of the tester with materials falling into one of the three groups of flammability are given. The instrument is built by Custom Scientific Instruments, Arlington, N.J. 1 illustration. E.S.

WAGES

"STENSON." Piece-rate procedure. Paper Box Bag Maker: 148-51, 243-6 (April, June, 1950); 11-13, 63-5, 108-11, 150-3, 199-202, 250-2 (July-December, 1950); 36-7 (January, 1951); *cf.* B.I.P.C. 20: 436.

The author gives useful directions for the setting of piece rates on auto-scoring machines and for some related operations in British box factories. Numerous data in tabular form are included. 10 figures. E.S.

WASTE PAPER

MAUDLIN, C. V. Washington report on waste paper. Fibre Containers 37, no. 4: 106-7 (April, 1952).

The activities of the Washington representative of the National Association of Waste Material Dealers are summarized. M.W.

WATER AND WATER TREATMENT

ANON. The big ditch—from Chipola River to St. Joe Paper Co. Southern Pulp Paper Manuf. 15, no. 4: 75-7 (April 10, 1952).

To provide water for additional facilities at the St. Joe Paper Company, an 18.5-mile waterway will be constructed from the Chipola River to Port St. Joe. The $2 million project will include several miles of open ditches connected by underground pipes under highways and other waterways. This is the longest and largest project of its kind in Florida and marks a forward step in the utilization of surface rather than ground water for industrial needs. 2 illustrations and 1 map. M.W.

WOLMAN, ABEL. Characteristics and problems of industrial water supply. J. Am. Water Works Assoc. 44, no. 4: 279-86 (April, 1952).

Although the industrial use of water has increased approximately 40% in the past ten years, and will continue to increase, the potential supply from existing sources is more than adequate. To make the supply readily available, however, will require more flexible and prompt inventories of water re-

sources, greater emphasis on ingenuity in the use and re-use of water and of wastes, and an extension or creation of facilities for investigation, development, and conservation of both surface and ground waters. To meet these needs, the maximum participation of forces on the federal, state, and local levels and of private industry will be required. 7 references. M.W.

WAXES

DULMAGE, WM. G. Waxes. Can. Chem. Processing 36, no. 4: 32-4 (April, 1952).

The process which is employed by International Waxes Ltd. for the manufacture of microcrystalline and paraffin waxes is described. Microcrystalline wax is produced from deasphalted brightstock residue by the solvent deoiling method. High-melting point paraffin is also refined by the solvent process. 5 illustrations and 1 flow diagram. M.W.

WET STRENGTH

HANSEN, OTTO. Wet-strength papers prepared with melamine resins. Allg. Papier-Rundschau no. 5: 208, 210-14 (March 8, 1952). [In German]

The author reviews the melamine resins at present employed in the German paper industry for wet-strengthening purposes, with particular reference to the water-soluble brands Madurit M4 conc. for fine papers and Madurit MF for technical papers, and Madural P, a water-insoluble emulsion which may be applied to the beater like rosin size, preferably in conjunction with it. The improvements in strength properties, modes of application, types of paper treated, their stability on storage, and the sorting and re-use of wet-strength waste papers are discussed. 5 tables, 1 figure, and 13 references. E.S.

ROHM & HAAS COMPANY. Jute boxes. Resin Rev. no. 3: 16-17 (February, 1952).

The addition of Uformite 700 to untreated stock in the manufacture of jute board (board made from waste paper) is reported. By the addition of 2% Uformite 700 a weatherproof board is produced which has an increased wet burst factor and meets the specifications for V2s construction. 1 table. M.W.

SPIWAK, L., and MOYER, A. E. Phenol-formaldehyde resins for wet-strength paper. Tappi 35, no. 4: 190-2 (April, 1952).

Data are presented for the increase in wet strength upon the beater addition of 1 to 25% of phenolic-type resin with different fiber furnishes and the effect of resin treatment on the dimensional stability of unbleached kraft stock. 5 tables and 12 references. E.S.

WHITE WATER

BRANDBERG, EJNAR T. White-water recovery at the Skoghall mills. Svensk Papperstidn. 55, no. 5: 179-80 (March 15, 1952). [In Swedish]

A brief description of the layout of the new filter plant at Skoghall, Sweden with eight Waco filters is given; provisions have been made for the installation of two additional units. 2 illustrations. E.S.

HALVORSEN, G. G. Paper mill effluent control using filtration with diatomaceous filteraids. Tappi 35, no. 4: 114-22A (April, 1952); *cf.* B.I.P.C. 18: 158-9.

Successful applications of diatomaceous filter aids to the white water treatment in several board mills and a facial tissue mill are described. Reference is made to other publications in which the advantages of these filter aids are discussed (*cf.* Wright, B.I.P.C. *22*: 364; Ehemann and others, B.I.P.C. 20: 912; and Norris, B.I.P.C. *22*: 575). 10 figures. E.S.

WOOD

BESLEY, LOWELL. Potential international timber supply. Can. Pulp Paper Ind. 5, no. 4: 118, 120, 122, 124, 126 (April, 1952).

The supply of timber from forest producing and exporting regions of the world is summarized, and the extent to which the production of these regions will compete with wood which is produced in Canada as a whole, and British Columbia in particular, is analyzed. 3 illustrations and 9 references. M.W.

MYERS, WALKER J. Pulpwood: a European raw-material problem. Foreign Commerce Weekly 47, no. 1: 3-4, 24-7 (April 7, 1952).

After World War II the pulp and paper industry of Western Europe was deprived of almost 4,500,000 cubic meters of pulpwood annually from countries behind the Iron Curtain. At the beginning of 1952 pulp production was, at a yearly rate, about a half million tons below its maximum potential, and pulpwood availabilities were about 1,900,000 cubic meters below the amount required for capacity output. To make up this deficit a co-operative program between the nations of Western Europe will have to be undertaken. The pulpwood production and consumption of each Western European country is summarized, and proposals are made for conserving and supplementing the present supplies. 3 illustrations. M.W.

WOOD—CHEMISTRY

BALLOU, CLINTON E., and PERCIVAL, E. G. V. Wood starches. Part II. The structure of the sapwood starch of the maple (*Acer* Spp.). J. Chem. Soc.: 1054-6 (March, 1952); *cf.* B.I.P.C. 22: 444-5.

Maple sapwood starch has been shown to contain approximately 19% of amylose. The methylated derivative, of high molecular weight, gave tetramethylglucopyranose (3.3-3.4%), 2,3,6-trimethylglucose (92-93%), and dimethylglucoses (4-5%) on hydrolysis, corresponding to an average chain length of 26 glucose units for the amylopectin fraction. Periodate oxidation gave a somewhat lower figure (22 units) for this fraction. 1 table. E.S.

BRUUN, TORGER. Hydrogen disproportionation in fossil stumps of Scots fir (*Pinus sylvestris* L.). Kgl. Norske Videnskab. Selskabs Skrifter no. 4 (1950, publ. 1951). 85 p. [In English]

The author has studied the components present in a stump of Scots pine buried in Norwegian peat; the wood is believed to be about 5000-6000 years old. Among the products isolated were *p*-cymene, the new liquid hydrocarbon "aromatic" fichtelite ($C_{19}H_{28}$), retene, *p*-menthane, dihydroabietic acid, dehydrofichtelite ($C_{19}H_{32}$), palmitic acid, and the new compound, *m*-hydroxybibenzyl. Derivatives of a number of these substances are described. Evidently

extensive demethylation and hydrogen disproportionation have taken place over the years. Numerous tables, 2 figures, and 127 references. L.E.W.

SHAW, A. C. The preparation and composition of some Canadian coniferous oils. Pulp Paper Mag. Can. 53, no. 4: 119-21 (March, 1952).

With a view to the profitable utilization of logging slash, branches, and foliage, the oil content of these wastes from all pines and spruces native to Ontario as well as lodgepole pine, hemlock, and eastern white cedar was investigated. Both large-scale distillations in commercial equipment and laboratory distillations were carried out. Oils of commercial value were obtained in acceptable yields from hemlock, black spruce, white cedar, and balsam fir. The chemical composition of these oils was also determined, and spruce and hemlock samples were found to contain important amounts of bornyl acetate; the most valuable constituent of cedar oil is thujone. 3 tables and 2 references. M.W.

WISE, LOUIS E. The chemical characteristics of tropical woods. Tappi 35, no. 4: 142-5 (April, 1952); *cf.* B.I.P.C. 21: 657.

The chemical characteristics of 17 tropical woods (data on eight of these have been reported in the previous reference) are discussed, and the results are compared with those obtained by other investigators. 2 tables, 1 diagram, and 15 references. E.S.

WISE, LOUIS E., RITTENHOUSE, RUTH C., and GARCIA, CONSUELO. The chemical composition of eight tropical woods as indicated by proximate analysis. Proc. Forest Products Research Soc. 5: 239-55; discussion: 255 (1951); *cf.* B.I.P.C. 21: 657.

A lengthier and more detailed discussion is presented of the work which is reported in the previous reference. 21 tables, 1 figure, and 30 references. M.W.

WOOD—SACCHARIFICATION

ROSEN, ERWIN. Composition of wood and yields obtained on hydrolysis. Chimie et industrie 67, no. 3: 415-22 (March, 1952). [In French] *cf.* B.I.P.C. 21: 201.

The author discusses the chemical composition of pine, fir, poplar, and beechwood, and the yields obtained when the wood is subjected to acid hydrolysis by the Meunier process (carried out at the Sorgues plant in France). Successive acid hydrolyses were used and, in the case of pine and poplar, details are given regarding the percentage of total and fermentable sugars in the hydrolyzates. The yields of undecomposed lignocellulose residues, furfural, and mixtures of acetone and methanol are also given. Some data are included for the products obtained from fir, beech, and chestnut wood; reasons for extreme losses in furfural yield and the relatively low yield of fermentable sugars are discussed. 4 tables and 3 references. L.E.W.

WOOD OPERATIONS

MORLEY, P. M. Further experiments with splitting guns. Pulp Paper Mag. Can. 53, no. 4: 141-2 (March, 1952); *cf.* B.I.P.C. 20: 526.

Investigations on the use of splitting guns in the field have shown that a slight modification in design (the substitution of four protruding pins for the

conventional round muzzle) will permit operation by one man and allow easier penetration into frozen wood. 5 illustrations. M.W.

WOOD STORING

KAIJSER, CHRISTIAN. How shall sulfite pulpwood be stored? Svensk Papperstidn. 55, no. 5: 173-5 (March 15, 1952). [In Swedish]

With frequent reference to Björkman's extensive publication on storage decay in pulpwood (*cf.* B.I.P.C. 17: 528), the author emphasizes the disadvantages of water storage. Previous studies have shown that dry wood gives higher yields than wet wood and that a uniform moisture content of the chips is a prerequisite for a satisfactory yield. Measurements of the water contents of logs stored as floating bundles, single logs, or bundles held entirely under water showed great variations in the different sections, irrespective of the storage method employed; they resulted not only from the different moisture in the log sections above and under water, but from variations between sap- and heartwood, which indicated that the moisture content of the latter is hardly influenced by underwater storage. In addition, tannin damage to water-stored wood will decrease the yield between 1 and 1.5%. A well-planned and operated woodyard as described by Björkman will give the most satisfactory results. 3 tables and 2 figures. E.S.

LINDGREN, RALPH M. Deterioration of southern pine pulpwood during storage. Proc. Forest Products Research Soc. 5: 169-80; discussion: 181 (1951).

Rough and peeled pulpwood of slash and loblolly pine which was stored in July and October, 1948 and May, 1949 at Bogalusa, La., was sampled at intervals during one year of storage. The effect of length and season of storage on the occurrence of decay and sapstain and on specific gravity and moisture content was determined. The percentage volume of decay was a fairly accurate criterion of specific gravity losses in rough bolts; the losses were greater for small than for large rough bolts but were greater in large peeled bolts than small. Moisture content of rough bolts remained favorable for decay after one year of storage. Loss of moisture was greatest in small bolts, both rough and peeled. With storage periods of less than one year rough bolts are likely to show less deterioration than peeled ones, and fall storage will reduce losses appreciably. Sapstain was most prevalent in peeled and in summer-cut bolts. The most prevalent decay in all groups was caused by *Peniophora gigantea* which attacked both cellulose and lignin. 5 tables, 12 figures, and 7 footnotes. M.W.

MCGOVERN, J. N., MARTIN, J. S., and HYTTINEN, A. Effect of storage of slash pine pulpwood on sulfate and groundwood pulp quality. Proc. Forest Products Research Soc. 5: 162-8; discussion: 168 (1951).

The loss in yield of sulfate and groundwood pulps on a wood-volume basis is proportional to the decrease in density of the pulpwood during storage. Fall-cut wood which is stored in open piles in a mill yard should be used within five months to avoid a measurable loss in the strength of the sulfate pulp. The principal effect of storage on the groundwood pulp is a decrease in brightness. 4 tables, 3 figures, and 7 footnotes. M.W.

WOOD WASTE

HAMMOND, R. N. The utilization of wood waste in the manu-

facture of chemical pulps in the Pacific Northwest. Proc. Forest Products Research Soc. 5: 150-4; discussion: 154 (1951).

The author describes the developments in heavy chipping and barking equipment which have greatly increased the tonnages of goods and sawmill wastes which are available as operating supplies for chemical-pulp conversion in the Pacific Northwest. Reference is made to the significance of new equipment and methods in the case of tree-farm integrated-plant operations, and the need for standardized measurement methods is pointed out. 7 references. M.W.

KUHN, W. H., CARSEY, E. A., and GUSLER, D. L. Power from wood waste. Mech. Eng. 73, no. 10: 809-11 (October, 1951).

The powerhouse of a modern furniture factory is described which was designed to operate on wood waste as a primary fuel with coal as a standby fuel. Details of the sawdust-, chips-, and shavings-collecting system, storage bin, drag-type conveyors, and the two water-tube boilers with suspension burning are given. Since the factory operates on an eight-hour day with load variations from 150 to 1500 kw., two multicylinder uniflow engines directly connected to two 1250-kv.-amp. generators were selected for power generation. The results of the installation have been gratifying; it is possible to produce 6.7 lb. of steam for every pound of wood waste. 7 figures. E.S.

YEAST

DUNN, CECIL GORDON. Food yeast. Wallerstein Labs. Communs. 15, no. 48: 61-79 (March, 1952).

An excellent, comprehensive review of the literature on food yeast, its production, composition, and uses is presented. The various organisms suitable for food-yeast production, the conditions affecting their growth, and methods of production on various types of substrates are discussed. 12 tables and 213 references. A.J.W.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ALPHA PULP

LIMERICK, JACK M. Method of removing hemicellulose from wood pulp. U. S. patent 2,592,300. Filed Sept. 10, 1946. Issued April 8, 1952. 4 claims. [Cl. 92-16]

A multistage, continuous process for the treatment of wood pulp is designed to provide an 80% yield (based on the weight of pulp treated) of an end product which contains more than 96% α-cellulose and which is suitable for use in the manufacture of clear cellulose acetate. This corresponds to Canadian patent 474,715; *cf.* B.I.P.C. 21: 885-6. 3 figures. E.G.S.

BARKERS AND BARKING

MERTZ, FRED A., and WALKER, ROBERT S. Barking drum. U. S. patent 2,592,054. Filed Oct. 3, 1950. Issued April 8, 1952. 4 claims. Assigned to Traylor Engineering and Manufacturing Company. [Cl. 144-208]

A barking drum comprises a continuous cyclindrical shell provided with milled bark-removal ports, each of which is reinforced by a bar fixed externally to the shell but suitably spaced therefrom. 3 figures. E.G.S.

WHITLOCK, WILLIAM R. Whirling roughing and finishing cutterhead machine for debarking logs and the like. U. S. patent 2,591,751. Filed Aug. 4, 1948. Issued April 8, 1952. 14 claims. Assigned one third to Clark W. Adams. [Cl. 144-208]

A whirling cutter-head machine is designed for barking logs of any taper and of different sizes without altering the taper or decreasing the size of the log below the bark. 15 figures. E.G.S.

BLACK LIQUOR—OXIDATION

BERGSTRÖM, HILDING O. V., and TROBECK, KARL G. Process for

utilizing waste liquor. Canadian patent 481,587. Filed Oct. 9, 1948. Issued March 11, 1952. 3 claims.

Prior to the concentration of kraft black liquor by evaporation, the liquor is treated with air or oxygen-containing gases (e.g., stack gases) in order to prevent the loss of volatile sulfurous constituents (i.e., hydrogen sulfide) during the evaporation process. E.G.S.

BLEACHING

NORTA, TURMA, and SIVOLA, YRJÖ. Process of refining chemical pulp. U. S. patent 2,593,173. Filed July 31, 1947. Issued April 15, 1952. 5 claims. Assigned to Enso-Gutzeit Osakeyhtiö. [Cl. 8-105]

Washed, defibered, and strained chemical pulp is chlorinated at room temperature, and then heated as a 1-15% aqueous suspension at approximately 40°C. for 10-200 minutes at a pH of less than 5. This is similar to Canadian patent 461,267; *cf.* B.I.P.C. 20: 282. E.G.S.

BOARD, BUILDING

CAMP, THOMAS P. Plaster-receiving base. Canadian patent 481,816. Filed July 10, 1947. Issued March 18, 1952. 4 claims. Assigned to Canadian Gypsum Company Limited.

This is the same as U. S. patent 2,562,859; *cf.* B.I.P.C. 22: 62. E.G.S.

BOARD SPECIALTIES

BERGSTEIN, FRANK D. Partition structure and method of making it. U. S. patent 2,593,092. Filed May 12, 1948. Issued April 15, 1952. 1 claim. [Cl. 229-42; changed to 93-1]

A divider or partition structure for cartons is described in which the main and cross ribs are of double thickness. A cushioning effect for fragile articles is provided which cannot be attained with a single thickness of material. 6 figures. E.G.S.

BUDD, LARRY J. Methods of and apparatus for making pallets. Canadian patent 481,692. Filed July 11, 1949. Issued March 11, 1952. 10 claims. Assigned to Pallet Devices, Inc.

A method and apparatus are provided for the fabrication of a pallet which consists of a rectangular platform of 60-point kraft board supported on short columns of thick-walled paper tubing. The method is the same as that described in U. S. patent 2,528,413; *cf.* B.I.P.C. 21: 281. 9 figures. E.G.S.

FERGUSON, KENNETH C. Paper board box cover lock. Canadian patent 481,675. Filed May 22, 1950. Issued March 11, 1952. 7 claims. Assigned to Inland Container Corporation.

This is same as U. S. patent 2,586,156; *cf.* B.I.P.C. 22: 626. E.G.S.

FORTUNATO, VINCENT. Carrier for bottles or like articles. Canadian patent 481,684. Filed Dec. 8, 1949. Issued March 11, 1952. 10 claims. Assigned to Morris Paper Mills.

A cardboard bottle carrier is cut from a single rectangular blank. The weight of the bottles is borne by the bottom and side walls of the carton, and retainer strips or bridge walls are located at the open ends of the carrier

to prevent the accidental dropping of bottles. This is the same as U. S. patent 2,491,039; *cf.* B.I.P.C. 20: 361. 4 figures. E.G.S.

FOURNESS, CHARLES A. Tampon applicator. U. S. patent 2,587,717. Filed Aug. 1, 1947. Issued March 4, 1952. 8 claims. Assigned to International Cellucotton Products Company. [Cl. 128-263]

The two tube elements of a tampon applicator are locked together against separation, and at the same time the free slidability of the ejector tube within the inner tube is preserved. This corresponds to Canadian patent 469,554; *cf.* B.I.P.C. 21: 361. 3 figures. E.G.S.

FUERST, EDWIN W. Display carton. U. S. patent 2,592,678. Filed Aug. 17, 1945. Issued April 15, 1952. 9 claims. [Cl. 206-45.11]

A cardboard display carton is compact, with no protruding parts, when closed and may be opened and set up in easel fashion without the use of any extra parts. Suitable retainers are employed as partial covers for each half of the carton so that the contents are retained in their respective halves as the carton is opened. 12 figures. E.G.S.

GILBERT, CLYDE L. Bottle carrier. U. S. patent 2,593,135. Filed June 2, 1948. Issued April 15, 1952. 4 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-52; changed to 229-28]

A paperboard bottle carrier is particularly adapted for use in conjunction with automatic loading machinery. The carrier is equipped with a metal or plastic bail-type handle. 8 figures. E.G.S.

MCNEALY, RAYMOND W., and GLASSMAN, JACOB A. Insulated container. U. S. patent 2,591,578. Filed Dec. 20, 1947. Issued April 1, 1952. 2 claims. [Cl. 229-14]

An insulated double-wall paper container for hot or cold beverages includes means for sealing the contents within an interior container and for enclosing the interior container within an exterior container in such a manner as to provide a dead air space around the interior receptacle. 4 figures. E.G.S.

MIDDLETON, CARL W. Display container. U. S. patent 2,591,276. Filed Feb. 18, 1947. Issued April 1, 1952. 4 claims. [Cl. 206-45.34]

A semicylindrical display package for corsages, suspenders, handkerchiefs, and the like consists of a cardboard base and end walls and a curved cover constructed of transparent acetate sheeting. 4 figures. E.G.S.

MYERS, HAROLD L. Display container. U. S. patent 2,593,333. Filed Aug. 2, 1947. Issued April 15, 1952. 2 claims. [Cl. 206-45.31]

A display container for merchandise incorporates a sliding closure which serves to cover and protect the merchandise against contamination in the closed position and to exhibit the articles in the open position. 8 figures. E.G.S.

NOLAN, LESTER S. Handle for carton carriers. U. S. patent 2,591,593. Filed July 13, 1949. Issued April 1, 1952. 2 claims. [Cl. 229-52]

A carton which is partitioned into 12 compartments for beverage bottles

and the like is equipped with a grip or handle member which is a portion of a partition, normally contained within the carton, and which may be extended from a side wall of the carton to provide a projecting handle member. 4 figures. E.G.S.

SHIRLEY, FREDERICK J. Wrapper or container of cardboard or like material. U. S. patent 2,591,882. Filed Oct. 28, 1949. Issued April 8, 1952. 6 claims. [Cl. 229-87; changed to 229-40]

A cardboard, strawboard, or pasteboard container which is suitable for use as a book wrap comprises two opposite side walls which are joined at their edges by an intermediate edge wall. The side walls incorporate co-operating closure flaps and slots which serve to reinforce the container against collapse. 11 figures. E.G.S.

BONDED FIBER WEBS

KILHAM, PETER. Manufacture of webs of material. Canadian patent 481,627. Filed Oct. 27, 1948. Issued March 11, 1952. 13 claims. Assigned to American Reenforced Paper Company.

A method and apparatus are described for the application of an adhesive to a web of loose, unspun fibers (e.g., sisal, jute, cotton, wool, rayon, or the like). This is the same as U. S. patent 2,533,167; *cf.* B.I.P.C. 21: 362. 14 figures. E.G.S.

CHLORINE DIOXIDE

HALLER, JOHN F. Process for the generation of chlorine dioxide. Canadian patent 482,179. Filed Oct. 30, 1948. Issued April 1, 1952. 4 claims. Assigned to Mathieson Chemical Corporation.

Chlorine dioxide is generated by the reaction of an acidified aqueous solution of sodium chlorate with sulfur dioxide in the presence of an inert diluent gas. This is the same as U. S. patent 2,510,034; *cf.* B.I.P.C. 20: 826. E.G.S.

CONCRETE

SCHNELL, AUGUST, and BOSSHARD, ALEXANDER. Method for producing lightweight concrete. U. S. patent 2,592,345. Filed Aug. 25, 1947. Issued April 8, 1952. 7 claims. Assigned to Durisol Inc. [Cl. 106-93; changed to 25-155]

A method of producing lightweight concrete from reduced organic fibrous material (e.g., wood shavings) and a calcium-containing cement comprises the steps of at least partially impregnating the fibrous particles with an aqueous aluminum sulfate solution; mixing the impregnated material with milk of lime, which reacts with the sulfate to form a gel on the surface of the fibrous particles; while the gel is still in a viscous state, mixing the fibrous material with a calcium-containing cement; molding the mixture; and permitting the molded mixture to harden to a rigid, porous structure. E.G.S.

DIELECTRICS

BENNETT, CHARLES E. Method of and apparatus for the manufacture of electric power cables. Canadian patent 481,851. Filed Aug. 28, 1946. Issued March 18, 1952. 5 claims. Assigned to The Okonite-Callender Cable Company, Inc.

In the manufacture of electrical power cables of the paper-insulated, oil-

impregnated, lead-sheathed type, the paper-insulated cable is dried, evacuated, oil impregnated, and sheathed, all in a continuous operation as the cable is advanced in an unreeled condition. 2 figures. E.G.S.

DISPENSING CONTAINERS

GWOOSH, STEPHEN J., and TAYLOR, CLARENCE E. Razor blade dispensing package. U. S. patent 2,592,138. Filed Jan. 16, 1950. Issued April 8, 1952. 4 claims. [Cl. 206-16]

A spring-loaded cardboard dispensing package for razor blades includes means for ejecting individual paper-wrapped blades. 6 figures. E.G.S.

HENDERSON, PORTER I. Carton for making ice-cream sandwiches. U. S. patent 2,591,812. Filed Jan. 7, 1950. Issued April 8, 1952. 2 claims. [Cl. 229-6]

A carton for an ice-cream sandwich comprises a rectangular sleeve and a U-shaped slide member which is adapted to hold the sandwich within the sleeve. The slide member may be pushed upwardly to eject the sandwich from the top of the sleeve. 10 figures. E.G.S.

HOULDSWORTH, WALLACE M. Dispensing containers. Canadian patent 481,901. Filed April 28, 1951. Issued March 25, 1952. 20 claims.

A cardboard dispensing container is adapted for the packaging of matches, toothpicks, and the like. This is the same as U. S. patent 2,557,290; *cf.* B.I.P.C. 21: 815. 12 figures. E.G.S.

EVAPORATION AND EVAPORATORS

TOMLINSON, GEORGE H., and SWARTZ, JOSEPH N. Apparatus for concentrating residual pulp liquor by direct contact with flue gases. U. S. patent 2,590,905. Filed Oct. 15, 1947. Issued April 1, 1952. 5 claims. Assigned to Canada Paper Company. [Cl. 159-4]

A cyclone evaporator is adapted for the concentration of kraft black liquor by direct contact with the flue gases resulting from the burning of the concentrated black liquor. 10 figures. E.G.S.

FLAX

HODGE, EDWIN T. Method of continuously digesting and drying flax straw. U. S. patent 2,591,069. Filed Aug. 31, 1945. Issued April 1, 1952. 2 claims. [Cl. 92-10]

A method is described for the treating, washing, and drying of flax straw or similar materials. The process depends upon the solubility of the pectinous binder material of the straw rather than upon its destruction by bacterial action. By the uniform treatment of the straw with boiling water under suitable conditions, the bundles of fibers are freed from the cuticle and epidermis on the outside and from the woody core on the inside, although the bundles themselves are not broken down. 7 figures. E.G.S.

FOLDING BOXES

BLOOMER, HARRISON C. Collapsible cardboard carton. U. S. patent 2,591,500. Filed July 16, 1948. Issued April 1, 1952. 2 claims. Assigned to Bloomer Bros. Company. [Cl. 229-31]

An integral collapsible cardboard carton for foods and other articles embodies means for securely interlocking its parts in the erected position. 5 figures. E.G.S.

GUYER, REYNOLDS. Tiltable display carton. U. S. patent 2,591,425. Filed May 19, 1948. Issued April 1, 1952. 5 claims. Assigned to Waldorf Paper Products Company. [Cl. 206-45.27]

A tiltable display carton is provided with supporting legs mounted on the rear wall, which serve to hold the carton in an inclined display position. 11 figures. E.G.S.

HENDRICK, WALTER T. S. Display carton and box. U. S. patent 2,593,143. Filed March 22, 1950. Issued April 15, 1952. 2 claims. Assigned to J. Lyons & Company Limited. [Cl. 206-45.31]

A display box for candy incorporates a hinged top panel which is provided with tongues that are foldable either to a display position in which they project inside the box to form a partition, or to a position in which the tongues lie in the plane of the panel and form a cover for the box. 4 figures. E.G.S.

INMAN, WILLIAM H. Cellular cushioned container. U. S. patent 2,591,548. Filed June 2, 1947. Issued April 1, 1952. 5 claims. Assigned to Bloomer Bros. Company. [Cl. 229-28]

A cardboard container for food products embodies a number of cellular compartments which are protected by cushioning walls, as well as means for securely locking the parts in erected condition. 6 figures. E.G.S.

FOLDING BOXES, SIFTPROOF

FARRELL, ROBERT A. Leakproof and siftproof packages. Canadian patent 481,838. Filed Aug. 13, 1951. Issued March 18, 1952. 2 claims. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,569,851; *cf.* B.I.P.C. 22: 218. E.G.S.

MACHINERY—BEATERS

SPENCER, ARTHUR M., JACOBSON, ABNER, and SIXT, KARL. Fiber beater for the liberation of cellulose fibers. U. S. patent 2,592,481. Filed June 18, 1948. Issued April 8, 1952. 3 claims. [Cl. 92-22]

A beater is described in which there are exerted a flexible whipping action and a turbulent throwing effect of softened fiber bundles (e.g., digested cotton-stalk fiber) suspended in liquid against a series of irregular baffles and walls. 3 figures. E.G.S.

STEPHANSEN, ERIK. Beating apparatus. U. S. patent 2,591,633. Filed Dec. 9, 1947. Issued April 1, 1952. 1 claim. Assigned to Otto Imset. [Cl. 92-27]

A beater consists of a roller and a casing which rotate in the same direction, but independently; their rotational speeds may be adjusted separately to obtain the desired relative peripheral speed. This is similar to Canadian patent 462,587; *cf.* B.I.P.C. 20: 448. 4 figures. E.G.S.

MACHINERY—BLOW-PITS

VON HILDEBRANDT, PAUL G. Apparatus for separating cooking liquor from pulp. U. S. patent 2,592,983. Filed July 17, 1947. Issued April 15, 1952. 12 claims. [Cl. 92-7]

An apparatus is provided in which cooking liquor is separated from the pulp by the passage of currents of steam through the pulp, and the resins and lignins are thereby maintained in a fluid condition. The equipment corresponds to that described in Canadian patent 443,607; *cf.* B.I.P.C. 18: 68. 12 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

ANDERSON, HELMER. Method and apparatus for lining blanks. Canadian patent 482,165. Filed July 12, 1948. Issued April 1, 1952. 20 claims. Assigned to General Mills, Inc.

A method and apparatus are described for feeding box blanks in spaced relation, applying a continuous strip of lining material to the series of spaced blanks, cutting the lining material between the blanks, and then slitting the lining material to correspond to the slots in the blanks. This is the same as U. S. patent 2,502,117; *cf.* B.I.P.C. 20:609. 31 figures. E.G.S.

FERRARO, JOSEPH V. Machine for erecting collapsed cartons. U. S. patent 2,592,880. Filed Sept. 17, 1947. Issued April 15, 1952. 24 claims. Assigned to Empire Box Corporation. [Cl. 93-37]

A machine is adapted for the opening and erection of partitioned egg cartons by means of traveling opening and folding elements which are controlled by a stationary cam mechanism. 25 figures. E.G.S.

JOA, CURT G. Bat forming machine and method. Canadian patent 481,903. Filed Aug. 25, 1948. Issued March 25, 1952. 22 claims.

A method and apparatus are described for the continuous on-edge assembly of a bat of wood fiber, commercial cellucotton, or the like. This is the same as U. S. patent 2,510,229; *cf.* B.I.P.C. 20: 831. 7 figures. E.G.S.

JOA, CURT G. Cellulose pad machine. U. S. patent 2,591,359. Filed June 14, 1950. Issued April 1, 1952. 30 claims. [Cl. 154-29]

A machine for the manufacture of catamenial napkins, diaper pads, and the like incorporates means for supporting a bulk supply roll of cellulose tissue, rotating the supply roll without the use of a mandrel and without the placement of destructive tensile stresses upon the tissue, and supporting the withdrawn web of tissue in such a way as to maintain its web shape. 27 figures. E.G.S.

MAGNANI, ALESSANDRO. Apparatus for making fibrous cement sheet material. U. S. patent 2,592,518. Filed Nov. 27, 1940. Issued April 8, 1952. 4 claims. [Cl. 92-54]

A machine is designed for the manufacture of a fibrous cement sheet of indefinite length by the deposition of an aqueous fibrous cement material upon a traveling pervious belt in contact with a moving suction support. The distributing and sheet-forming device of the machine is constructed in the form of an open center frame which includes end and side walls; one of the end walls acts as a spreader. 10 figures. E.G.S.

RYBERG, NILS. Machine for manufacturing fiberboards. U. S. patent 2,592,470. Filed Aug. 31, 1948. Issued April 8, 1952. 8 claims. [Cl. 154-1]

A machine which is designed for use in the manufacture of structural board from straw or similar long-fibered vegetable material comprises an open-end channel whose cross section corresponds to the cross section of the board to be produced, a hopper for supplying measured quantities of the fibrous raw material into one end of the channel, and a reciprocating plunger in the inlet portion of the channel for compacting and gradually feeding the fibrous material through the channel. 9 figures. E.G.S.

MACHINERY—CONVEYORS

ROOKSBY, WILLIAM H. Plant for shaping asbestos cement. U. S. patent 2,593,611. Filed June 1, 1946. Issued April 22, 1952. 17 claims. Assigned to Turners Asbestos Cement Company Limited. [Cl. 92-66]

A mechanized plant for the production of flat or corrugated sheets, tiles, or slates of asbestos cement is described in which the sheets are carried through the plant by conveyors which, for the most part, are intermittently driven and automatically controlled. 23 figures. E.G.S.

MACHINERY—EMBOSSING MACHINERY

ILLNER, PAUL R. Apparatus for embossing paper. U. S. patent 2,593,149. Filed Oct. 17, 1946. Issued April 15, 1952. 2 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 101-23]

An embossing calender comprises an engraved steel embossing roll and a co-operating, yielding-surface, compressed paper embossing roll which is parallel to the steel roll, and means for pressing the rolls together with uniform pressure throughout the width of the web being embossed. Both rolls are of uniform diameter throughout their lengths. 2 figures. E.G.S.

MACHINERY—FILTERS

CHASE, CHARLES B. Filter cartridge. Canadian patent 481,976. Filed May 17, 1950. Issued March 25, 1952. 3 claims. Assigned to Fram Corporation.

This is the same as U. S. patent 2,564,637; *cf.* B.I.P.C. 22: 72. E.G.S.

MACHINERY—PACKAGING MACHINERY

BUTTERY, KENNETH T., and HUBBARD, EUGENE R. Egg carton filling apparatus. Canadian patent 481,713. Filed Dec. 17, 1949. Issued March 11, 1952. 3 claims. Assigned to Sutherland Paper Company.

An apparatus for filling egg cartons incorporates means for releasing a positioned group of eggs into the compartments of a cellular container. This is the same as U. S. patent 2,507,489; *cf.* B.I.P.C. 20: 760. 6 figures. E.G.S.

CLARKE, HAROLD E. Roll wrapping machine. Canadian patent 481,640. Filed Nov. 28, 1949. Issued March 11, 1952. 3 claims. Assigned to Canadian International Paper Company.

This corresponds to U. S. patent 2,564,594; *cf.* B.I.P.C. 22: 73. E.G.S.

COON, HAROLD R., SR., and RAPP, EARL J. Wrapping machine for butter and the like. U. S. patent 2,592,793. Filed May 14, 1945. Issued April 15, 1952. 1 claim. Assigned to Lynch Package Machinery Corporation. [Cl. 53-131]

An automatic wrapping machine for butter, oleomargarine, lard, and similar products incorporates flap-folding devices which are operable in timed sequence and in such a manner that a print of butter or the like is wrapped in parchment and discharged to a conveyor for transfer to a cartoning mechanism. 25 figures. E.G.S.

HOHL, GEORGE I., WEISE, FREDERICK H., RIST, GOTTLIEB A., and RIST, JOHN M. Wrapping machine. U. S. patent 2,592,283. Filed April 8, 1947. Issued April 8, 1952. 5 claims. Assigned to Processing Equipment Corporation. [Cl. 53-134]

A high-speed, continuous wrapping machine which is designed for use in the packaging of candy or tablets comprises a continuously rotating wrapping wheel which has circumferentially spaced pockets opening outwardly from its periphery for the reception of articles to be wrapped, together with wrapper material (e.g., cellophane or waxed paper) for enclosing the articles. 13 figures. E.G.S.

PALMER, WILLIAM C., and KOTTMANN, ARTHUR A. Wrapping machine. U. S. patent 2,592,726. Filed Nov. 24, 1948. Issued April 15, 1952. 13 claims. Assigned to The Bettendorf Company. [Cl. 53-111]

A bread-wrapping machine embodies adjustable means for wrapping loaves of different sizes. 19 figures. E.G.S.

SALFISBERG, LEROY L. Machines for fabricating packages. Canadian patent 481,990. Filed April 7, 1949. Issued March 25, 1952. 6 claims. Assigned to Ivers-Lee Company.

A machine is designed primarily for the manufacture of infusion bags, especially tea bags. This is the same as U. S. patent 2,472,440; *cf.* B.I.P.C. 19: 824. 7 figures. E.G.S.

MACHINERY—PASTING MACHINE

CHALMERS, JOHN W., and JACKSON, DONALD R. P. Packet making machine. U. S. patent 2,591,135. Filed June 17, 1946. Issued April 1, 1952. 9 claims. Assigned to Molins Machine Company, Limited. [Cl. 93-50]

A packet-making machine embodies means for adhesively securing the overlapping portions of a cardboard packet, which comprise a rotatable wheel having at least one pocket adapted to receive, accurately hold, and locate a partly finished packet; a plate located at the side of the pocket, adapted to press against the overlapping flaps of a packet in the pocket; and means for heating the plate in such a manner that the adhesive on the flaps is dried while the overlapping flaps are accurately held in position by the pocket. 16 figures. E.G.S.

MACHINERY—PULPERS

WANDEL, KURT. Apparatus for subjecting materials to a disin-

tegrating or pulping treatment. U. S. patent 2,592,215. Filed July 4, 1945. Issued April 8, 1952. 8 claims. [Cl. 92-23]

An apparatus is adapted for the defibering of waste paper. This corresponds to Canadian patent 462,456; *cf.* B.I.P.C. 20: 452. 12 figures. E.G.S.

MACHINERY—REFINERS

OTTERSLAND, PETER N., RIGABAR, NAPOLEON, and LANSING, EDWARD S. Method of and machine for treating fibrous or cellulosic material. U. S. patent 2,592,594. Filed Oct. 27, 1948. Issued April 15, 1952. 4 claims. Assigned to Taylor Refiner Company, Inc. [Cl. 241-28]

A method and machine are adapted for the treatment of loose pulp or lap, chemically treated pulp, or raw pulp, and for the conversion of such material into a fibrous mass suitable for use in paper- and boardmaking. The material is subjected to a crushing action in the nip of a rotary abrasive roll and a rotary feeding roll, and the fibers are rubbed or crushed against each other. 7 figures. E.G.S.

MACHINERY—SCREENS

SCHENK, HARRY F. Apparatus for screening a suspension of solid material in a liquid. U. S. patent 2,593,202. Filed Jan. 24, 1947. Issued April 15, 1952. 2 claims. [Cl. 92-36]

A rotary pulp screen embodies a drive mechanism which is self-lubricating while in operation and which functions during relative oscillation of the screen. 4 figures. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

RAPP, EARL J., and COON, HAROLD R., SR. Sheet feeder mechanism. U. S. patent 2,592,822. Filed May 27, 1946. Issued April 15, 1952. 6 claims. Assigned to Lynch Package Machinery Corporation. [Cl. 271-23; changed to 271-10]

A mechanism for feeding sheets of paper, parchment, cellophane, or the like to a wrapping machine incorporates free-wheeling picker rolls which serve to prevent accidental tearing of the sheet material as it is picked up by continuously rotating feed rolls. 4 figures. E.G.S.

MACHINERY—SLITTERS AND WINDERS

WEAVER, ALLEN E. Paper winding and smoothing device. U. S. patent 2,592,090. Filed Aug. 30, 1946. Issued April 8, 1952. 3 claims. Assigned one half to Hammond Bag & Paper Company. [Cl. 242-76]

A paper winder incorporates means for crowning a traveling paper web just as it goes into a roll, thus eliminating any tendency of the web to wrinkle. The crowning effect is secured by the provision of a spreader bar which is arched to a slight extent, and which is pivotally supported in such a manner that counterweights can be used to hold it in yieldable, operative engagement with the paper web. 2 figures. E.G.S.

MOLDED PULP ARTICLES

HEYMANN, ROY D. Hunter's decoy. Canadian patent 482,122.

Filed Jan. 22, 1946. Issued April 1, 1952. 1 claim. Assigned to Animal Trap Company of America.

A molded-pulp bird decoy is provided with means for ballasting the body as required. This is the same as U. S. patent 2,495,720; *cf.* B.I.P.C. 20: 535. 5 figures. E.G.S.

LENNON, JAMES W. Egg carton. U. S. patent 2,591,446. Filed Dec. 12, 1947. Issued April 1, 1952. 4 claims. Assigned to Shellmar Products Corporation. [Cl. 229-2.5]

A molded-pulp egg carton comprises a bottom section which includes a series of egg-receiving cells, and a top section which consists of a pan-shaped member having a flat upper surface, so that the top of the carton may be decorated or printed to show the origin of the eggs. 9 figures. E.G.S.

SCHWERTFEGER, WALTER J. Molded pulp container. U. S. patent 2,591,471. Filed Sept. 16, 1950. Issued April 1, 1952. 4 claims. Assigned to Keyes Fibre Company. [Cl. 229-2.5; changed to 229-45]

A molded-pulp egg carton is formed with two rows of egg-receiving cups, six cups in each row. The rows are separated by a hollow, longitudinal division wall, and the cups of each row are separated by hollow, transverse division walls. 6 figures. E.G.S.

PACKAGING

BORCK, ADAM J. Natural apple preserving method. U. S. patent 2,576,919. Filed Sept. 17, 1948. Issued Dec. 4, 1951. 9 claims. [Cl. 99-154]

A method of preserving fresh apples in their natural state comprises the steps of packing freshly picked apples in layers in a container, between interposed sheets of relatively thick, moisture-absorbent paper (e.g., heavyweight white blotting paper which is saturated with an aqueous solution of salt and honey, and placing the fruit in an atmosphere maintained at 31-45°F. The saturating solution is pretreated with charcoal to induce a vapor interchange between individual apples and the solution in the paper during the normal breathing of the apples. E.G.S.

COLGREN, CARL T. Package of stacked receptacles. Canadian patent 481,712. Filed May 1, 1948. Issued March 11, 1952. 12 claims. Assigned to Sutherland Paper Company.

A package of stacked paper cups is wrapped in a heat-sealable transparent wrapper, and a label is enclosed within and supported in position by the wrapper. 5 figures. E.G.S.

PAPER—COATED

TRIST, ARTHUR R. Machine for the coating of webs of material. U. S. patent 2,593,074. Filed Nov. 25, 1949. Issued April 15, 1952. 7 claims. [Cl. 118-409]

A coating machine comprises a resilient moving bed which supports a web of material, a fountain for the coating composition which has a floor at its lower part to form a stock for a stationary elastic trailing blade for controlling the application of the composition, and dikes for limiting the width

of the foundation for the coating composition. The length of the blade is less than the distance between the outer edges of the dikes. The corners where the blade, the facing surfaces of the dikes, and the surface of the web meet are sealed against liquid leakage by angular elements, each of which rests on the floor of the fountain. 16 figures. E.G.S.

PAPER SPECIALTIES

BRINKER, HOWARD C. Plasticized polyvinyl acetate emulsion. U. S. patent 2,577,734. Filed Jan. 31, 1951. Issued Dec. 11, 1951. 16 claims. Assigned to Minnesota Mining & Manufacturing Company. [Cl. 260-27]

A greaseproofing agent for paper and cardboard comprises a polyvinyl acetate emulsion plasticized with a composition which consists of an ester of glycerol (or sorbitol) and abietic acid having at least one unreacted hydroxyl group. E.G.S.

ENGEL, EDWARD W., GIOLITO, ETZIO J., MCGARRY, JAMES A., MORRIS, VLON N., and WEIDNER, CHARLES L. Flexible pressure-sensitive adhesive products. U. S. patent 2,592,550. Filed Oct. 6, 1949. Issued April 15, 1952. 7 claims. Assigned to Industrial Tape Corporation. [Cl. 117-122]

A normally tacky, pressure-sensitive adhesive tape is provided which is resistant to delamination. As an example, a highly porous absorbent paper (basis weight 75 lb., 24 × 36—480), preferably uncalendered and unsized but having rugosities such as are obtained by crimping or embossing, is saturated by passage through an impregnating bath which contains an aqueous dispersion comprising 40% solids and having the following composition: 65 parts of a butadiene-acrylonitrile copolymer (60:40); 20 parts of a butadiene-styrene copolymer (50:50); 14.5 parts of a butadiene-styrene copolymer (10:90); and 0.5 part of a standard antioxidant (e.g., heptylated diphenylamine). The paper is saturated with 100% of impregnating solids, based on its original weight. The sheet is dried in a festoon, and the following normally tacky, pressure-sensitive adhesive composition is applied to the dry sheet: 80 parts of reclaim rubber, 50 parts of crude rubber, 95 parts of hydrogenated rosin, 60 parts of calcium silicate, 30 parts of mineral oil, and 2 parts of phenyl-2-naphthylamine. The adhesive mass is applied from *n*-heptane solvent by a reverse roll coater in this particular operation, although hot-melt coating, calendering, disperse coating, knife coating, or any other suitable method may be used. The adhesive has a coating weight of approximately 2.65 oz./sq. yd. E.G.S.

GLASER, RUDOLF F. Paper container with dispensing and filling openings for liquids. U. S. patent 2,593,019. Filed March 28, 1947. Issued April 15, 1952. 4 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-17]

A paperboard milk container is provided with a sanitary pour opening and lip, combined with means for protecting the same against contamination. 5 figures. E.G.S.

HANSMAN, JOHN F., and JURISCH, MELVIN J. Photographic carbon tissue. U. S. patent 2,590,857. Filed Sept. 10, 1945. Issued April 1, 1952. 11 claims. [Cl. 101-128.2; changed to 101-128.3]

A photographic carbon tissue which is adapted for use in silk-screen

work comprises an opaque paper backing, an unsensitized water-soluble colloidal coating applied to the backing, and a thin porous film on the surface of the colloid which contains approximately equal amounts of cellulose nitrate and glycerin. 2 figures. E.G.S.

SCHNEIDER, HELMUTH G., YOUNG, DAVID W., and ROCCA, JULIUS P. Polyethylene-wax compositions. U. S. patent 2,577,816. Filed May 23, 1946. Issued Dec. 11, 1951. 2 claims. Assigned to Standard Oil Development Company. [Cl. 260-28.5]

A waterproof wax coating composition which is characterized by a low tendency toward blocking and high strength consists of 1-50% of polyethylene (molecular weight 20,000) in chlorinated wax (m.p. 130°F.) containing 2.8% chlorine. E.G.S.

SMITH, ARCHIE E. Screen supported paper bag for tank cleaners. U. S. patent 2,591,382. Filed Oct. 30, 1948. Issued April 1, 1952. 6 claims. Assigned to General Electric Company. [Cl. 183-51]

A disposable, porous paper dust bag for a vacuum cleaner may be used as a liner for a conventional cloth dust bag, or alternatively, as the only dust collector in a cleaner. 7 figures. E.G.S.

THOMPSON, HOWARD H. Method of molding dishlike articles. U. S. patent 2,592,080. Filed June 6, 1947. Issued April 8, 1952. 4 claims. Assigned to Weavewood, Inc. [Cl. 154-83]

In the manufacture of molded bowl- or dishlike articles (e.g., kitchen or table ware) from wood veneers, an impregnated, interwoven mat of veneer strips is employed as a surface layer in laminated combination with a resin-impregnated, creped kraft paper filler. 3 figures. E.G.S.

TOULMIN, HARRY A., JR. Method of making containers. U. S. patent 2,592,081. Filed March 26, 1949. Issued April 8, 1952. 4 claims. Assigned to The Commonwealth Engineering Company of Ohio. [Cl. 93-35]

In the manufacture of rubber sponge-lined paper bags or laminated containers, a gas-impregnated rubber latex, released and deposited on a base material (i.e., paper), is vulcanized and integrally united to the base sheet. 7 figures. E.G.S.

WITTHOFT, HERBERT C. Rot-resistant insulated cable. Canadian patent 481,628. Filed June 23, 1949. Issued March 11, 1952. 1 claim. Assigned to Anaconda Wire and Cable Company.

This is the same as U. S. patent 2,577,059; *cf.* B.I.P.C. 22: 381. E.G.S.

YORKE, NELSON R. Craze-resistant synthetic resin products and process. Canadian patent 482,055. Filed May 23, 1946. Issued March 25, 1952. 9 claims. Assigned to St. Regis Paper Company.

A craze-resistant, pigmented surface is imparted to a sheet of fibrous material (e.g., paper, cotton, asbestos, glass cloth, or the like) by a coating of a thermosetting urea or melamine resin which contains a pigment and about 2-12% by weight of glass fibers. E.G.S.

PIGMENTS

WILLCOX, OSWIN B. Production of TiO_2 pigments. U. S. patent 2,591,988. Filed Sept. 14, 1950. Issued April 8, 1952. 7 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 241-22]

A process for the preparation of a calcined white titanium pigment comprises the dry grinding of the pigment in the presence of 0.05-5% (based on the weight of the pigment) of an aerogel. E.G.S.

RAYON—VISCOSE PROCESS

BRADSHAW, WILLIAM H., and SCHMITZ, WILLIAM R., JR. Apparatus for cellulose processing. U. S. patent 2,592,112. Filed Dec. 6, 1947. Issued April 8, 1952. 4 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 23-260]

An apparatus for the continuous production of alkali cellulose of uniform composition comprises a jacketed, slurry-forming receptacle which is provided with a cellulose feed inlet, a sodium hydroxide-solution inlet connected to a constant-level supply system, agitators to form the slurry, and a slurry outlet connected to a metering pump at the bottom of the receptacle; a receiver for the slurry; and a slurry-separating device which consists of a container equipped with sealed rotatable press rolls designed to maintain the slurry under pressure and to pass the slurry out of the device. 1 figure. E.G.S.

SAMUELSON, HANS O. Process of making alkali cellulose. U. S. patent 2,592,746. Filed Nov. 8, 1949. Issued April 15, 1952. 5 claims. Assigned to Mo och Domsjö Aktiebolag. [Cl. 260-233]

As an example, a bleached sulfate pulp from pine is mercerized. The resulting alkali cellulose contains 2.43% of pentosans which cannot be dissolved by means of mercerizing liquor. The mercerization is carried out at 20°C. over a period of one hour. After the aging of the alkali cellulose for 10 hours, a repeated treatment with mercerizing liquor causes the greater part of the pentosans to be dissolved. The pentosan content of the residue is 0.75%. An extension of the aging period to 30 hours causes the corresponding figure to be lowered to 0.63%. Aging is effected at 25°. The original pulp had a viscosity of 44.8 centipoises (TAPPI); after aging for 10 hours, the viscosity becomes 16.1 centipoises; after 30 hours' aging, it is 7.7 centipoises. E.G.S.

TACHIKAWA, SHOZO. Process for manufacturing macromolecular cellulose fiber. U. S. patent 2,592,355. Filed Feb. 20, 1950. Issued April 8, 1952. 3 claims. [Cl. 18-54]

A process is described for the manufacture of a macromolecular cellulose fiber with a degree of polymerization above 500. As an example, a refined cotton linter with a D.P. of 1460 is used as a raw material. It is steeped in a 13.2% sodium hydroxide solution for 20 minutes at 15°C. and 10 mm. of vacuum and for 60 minutes under 15 atmospheres' pressure, and compressed in a steeping press. The resultant alkali cellulose contains 38.4% cellulose and 12.6% total alkali. Carbon disulfide is added to the alkali cellulose, and after xanthation and dissolution under 12 atmospheres' pressure, viscose is obtained. E.G.S.

RESIN, SYNTHETIC

GERHART, HOWARD L. Accelerators for addendum type resins. U. S. patent 2,578,690. Filed Oct. 4, 1949. Issued Dec. 18, 1951.

35 claims. Assigned to Pittsburgh Plate Glass Company. [Cl. 260-45.3]

An amine-aldehyde condensation product is intended for use as a catalyst in the impregnation or coating of fibrous materials. As an example, a 3% solution of an aniline-butyraldehyde condensation product in acetone may be used to deposit the catalyst in leather, paper, asbestos, sisal, cotton batting, glass fiber, cellular glass, rubber, or plastic by the passage of the material to be impregnated through the catalyst solution, removal of the excess by drainage, and oven drying for five minutes at 200°F. to remove the acetone. The materials are then saturated with a copolymer resin by dipping, soaking, or vacuum impregnation methods. The curing process is accelerated by the catalyst and, with suitable resins, may be accomplished by heating for 3-30 minutes at 250°F. E.G.S.

ROOFING FELTS

CLARVOE, GEORGE W. Asbestos roofing felt and method of manufacture. U. S. patent 2,593,010. Filed Dec. 4, 1948. Issued April 15, 1952. 9 claims. Assigned to Johns-Manville Corporation. [Cl. 154-142; changed to 154-121]

A light-reflecting, flexible roofing felt comprises a base sheet of bitumen-saturated fiber felt and a top surface sheet of white asbestos paper adhered by bituminous adhesive to the base sheet to form a flexible multi-ply felt. The paper surface ply incorporates 0.5-10% of stearic acid (based on the weight of the paper sheet) in the form of thin coating films throughout its porous structure. 1 figure. E.G.S.

SEMI-CHEMICAL PULPING PROCESS

SUTHERLAND, DANIEL M. Process of making paper pulps. U. S. patent 2,591,106. Filed July 24, 1947. Issued April 1, 1952. 5 claims. Assigned to Lionel M. Sutherland and Douglas G. Sutherland. [Cl. 92-13]

In a process for the production of paper pulp from wood, the wood chips are subjected to the digestive action of hot alkaline cooking liquor at 340°F. and 110 p.s.i. for a limited time interval, only sufficient to soften the encrustant bond holding the cellulose fibers together, without separating the fiber bundles; the resultant limited cook is blown to a blowtank at atmospheric pressure; the cook is diluted to a refining consistency by the addition of hot alkaline wash liquor at 160-180°; the hot, diluted pulp suspension is refined at 180-210°; the refined pulp is washed while hot; and the resultant hot, alkaline wash liquor is used in diluting the cook as indicated above. 1 figure. E.G.S.

SHIPPING CONTAINERS

KELLER, KARL H. Package construction. U. S. patent 2,591,703. Filed April 13, 1950. Issued April 8, 1952. 6 claims. Assigned to The Miller Company. [Cl. 229-6; changed to 206-65]

A paperboard shipping carton for a fluorescent lighting fixture incorporates steel strapping for anchoring the fixture to an inner wall of the carton. 12 figures. E.G.S.

SPALDING, RICHARD O. Duplex divisible carton. U. S. patent 2,591,629. Filed July 16, 1949. Issued April 1, 1952. 7 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-15]

A duplex carton comprises two units, each of which is adapted to hold a dozen bottles. After the filled carton has been shipped from the bottling plant to the distributor, it can be divided to provide two individual cartons which are adapted for retail sale. 8 figures. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

MEAKER, JOHN W. Perforated multiple ply bag. U. S. patent 2,593,328. Filed July 13, 1948. Issued April 15, 1952. 4 claims. [Cl. 229-55]

A multi-ply bag is constructed of paper or similar thin, flexible air-impervious sheet material which has been electrically perforated to permit entrapped air to escape through the walls as the bag is being filled. 12 figures. E.G.S.

SISAL

STEPHANUS, HENDRICUS, and RINSE, JACOBUS. Alkali treatment of agave and manila hemp fibers to produce flexible fibers. U. S. patent 2,591,315. Filed Aug. 26, 1948. Issued April 1, 1952. 16 claims. Assigned to Jacobus Rinse and Willem Dorst. [Cl. 8-125; changed to 92-14]

Flexible, high-tensile strength fibers which are suitable for use in the manufacture of rope or cloth are produced from agave and manila hemp fibrous masses. As an example, 10 parts of sisal are soaked for 16 hours at about 20°C. in a solution of nine parts of zinc oxide and 27 parts of sodium hydroxide in 64 parts of water. The excess solution is removed as thoroughly as possible by squeezing, and the fibers are washed successively with water, 1% hydrochloric acid, and water. After the fibers have been dried and immersed in an emulsion of rapeseed oil and water, they are suitable for mechanical processing. E.G.S.

TALL OIL

JENNESS, LESLIE G. Method of purifying solid saturated fatty acids containing unsaturated free fatty acids and other soluble impurities. U. S. patent 2,593,458. Filed July 7, 1948. Issued April 22, 1952. 22 claims. Assigned to The Trendex Co. [Cl. 260-419; changed to 260-97.6]

A method of treating tall oil containing saturated fatty acids and impurities comprises the steps of hydrogenating the tall oil; forming discrete particles of the hydrogenated material; extracting the material with a mixture containing benzene and heptane as a solvent for the resin acid constituent; allowing the solvent to penetrate into the particles without disrupting them; and removing the resulting solution. 1 figure. E.G.S.

ST. CLAIR, WILLIAM E., and LAWRENCE, RAY V. Metal resinates and method of preparation. U. S. patent 2,572,071. Filed July 11, 1950. Issued Oct. 23, 1951. 33 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 260-105]

As an example, a process of preparing a refusible, turpentine-soluble zinc resinate which has a zinc content of about 5% and a melting point no higher than about 181°C. comprises the heating at above 150° of 100 parts of a rosin material (e.g., gum rosin, rosin acid esters, rosin acids, decarboxy-

lated rosin, rosin drying oil, tall oil, disproportionated rosin, partially hydrogenated rosin, and partially dehydrogenated rosin) with 0.01-30 parts of monomeric aldehyde equivalent of an aldehyde-yielding material, and at least five parts of zinc oxide equivalent of a reactive zinc material (e.g., zinc, zinc oxide, zinc carbonate, and the zinc salts of carboxylic acids which yield zinc to the rosin under the conditions of the reaction). When tall oil is reacted with the aldehyde, the resulting product may be reacted with manganese acetate to give a clear, homogeneous, petroleum naphtha-soluble manganese resinate which is a viscous liquid at room temperature. E.G.S.

SMITH, ROSCOE S. Purification of tall oil pitch. U. S. patent 2,591,885. Filed Aug. 25, 1949. Issued April 8, 1952. 4 claims. Assigned to West Virginia Pulp & Paper Company. [Cl. 260-97.7]

A method of treating tall oil pitch consists in forming a mixture of the pitch and a dilute aqueous sodium hydroxide solution; allowing the mixture to stand at a temperature near its boiling point, but without causing it to boil, until an upper oil layer separates; separating the upper layer from a lower aqueous layer which contains fatty acid soaps; and recovering the insoluble upper layer which consists largely of fatty acid esters of alcohols originally present in the pitch. 1 figure. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

MCCARTHY, JAMES F. Water- and flameproofing composition. U. S. patent 2,591,368. Filed Jan. 22, 1947. Issued April 1, 1952. 1 claim. Assigned to Treesdale Laboratories and Textile Processing Company. [Cl. 260-17]

A water- and flameproofing composition for the coating or impregnation of textiles, fibers, or filaments of cellulose, rayon, wool, silk, or the like consists of 14% of a 55% aqueous dispersion of polyvinyl chloride, 6.5% of a plasticizing agent for the polyvinyl chloride (e.g., dibutyl phthalate, dioctyl phthalate, ethyl phthalyl ethyl glycolate, or methoxyethyl acetylricinoleate), 75.5% of a 70% aqueous dispersion of antimony oxide, 3% of a 2% solution of sodium carboxymethylcellulose, and 1% of a 28% solution of ammonium hydroxide (all compositions by weight). E.G.S.

VANILLIN

MARSHALL, HARRY B., and SANKEY, CHARLES A. Method of producing vanillin. Canadian patent 482,191. Filed Oct. 6, 1949. Issued April 1, 1952. 7 claims, including 3 supplementary disclosures. Assigned to The Ontario Paper Company Limited.

A method of producing vanillin consists in subjecting spent sulfite liquor in an alkaline medium (i.e., caustic soda) to the action of a finely dispersed gas (e.g., air) containing free gaseous oxygen at a temperature above 150°C. and under a partial pressure of oxygen of less than 20 p.s.i., for a period of less than four hours. This is similar to U. S. patent 2,544,999; *cf.* B.I.P.C. 21: 603. 1 figure. E.G.S.

WASTE LIQUOR

NILSSON, NILS E. Apparatus for recovering the inorganic content of concentrated waste liquor. U. S. patent 2,591,188. Filed July 5, 1947. Issued April 1, 1952. 2 claims. [Cl. 23-277]

In a process for the recovery of inorganic material from spent cooking

liquor, after initial concentration, the liquor is introduced through an injector nozzle together with primary air into a combustion chamber, in the form of a cloud or spray of fine particles. If the chamber has been preheated to a sufficiently high initial temperature by the burning of fuel oil, the finely dispersed liquor particles are almost immediately relieved of their water content through evaporation and burn directly with the primary air, so that a hot flame is formed at the mouth of the injector nozzle. The larger particles begin to boil in the flame and, while continuing to give off water, fall onto a grating where they accumulate in a solid glowing bed, which is burned with another quantity of primary air introduced adjacent to the bottom of the furnace through stationary nozzles or tuyères located in the furnace walls. After reduction with the carbon present in the bed, the inorganic content of the liquor is collected in smelted condition on the sloping bottom of the chamber and drawn off through a spout. The incompletely burned combustion gases are burned completely with secondary air which is introduced through another set of stationary nozzles. 7 figures. E.G.S.

WHITE LIQUOR

KAHN, JAMES M. Cooking liquor treatment. U. S. patent 2,592,907. Filed March 8, 1949. Issued April 15, 1952. 5 claims. Assigned to Infilco Incorporated. [Cl. 252-183]

In the clarification of white liquor for use in alkaline pulping the white liquor is centrifuged, and the resulting turbid filtrate is treated with a magnesium compound to coagulate the turbidity and provide a precipitate which is readily separable from the purified white liquor. 2 figures. E.G.S.

AUTHOR INDEX TO BOOKS

Allison, F. E. 648
American Paper and Pulp Association 647
Anderson, M. S. 648
Avery, C. B., ed. 647
Brewster, K. G., ed. 647
Butler, J. A. V., ed. 647
Calvin, M. 647
Celler, E. 648
Cramer, F. 647
Emery, H. G., ed. 647
Fishenden, R. B., ed. 648
Forest Products Research Society .. 648
Heidelberger, C. 647
Judd, D. B. 647
Keyes, K. S., Jr. 648
Labarre, E. J., ed. 648
McCabe, L. C. 647
McKay, H. C. 648
Northeastern Wood Utilization Council 647
Orthmann, A. C. 648
Reaumur, R.-A.-F. de 648
Reid, J. C. 647
Tolbert, B. M. 647
U. S. Congress, House. *Committee on the Judiciary. Subcommittee on Study of Monopoly Power.* 648
U. S. Dept. of Agriculture 648
United States Technical Conference on Air Pollution 647
Yankwich, P. E. 647

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Abele, W. 677
Adair, N. T. 672
Adams, C. W. ..... P 704
"Alaric." 662
Alliance Paper Mills 676
American Pulp & Paper Association 678
American Reenforced Paper Company ..... P 707
Anaconda Wire and Cable Company. P 716
Anderson, H. ..... P 710
Andersson, W. 685
Animal Trap Company of America .. P 714
"Anion." 693
Aron, G. 683
Askania Regulator Company 669
Asunmaa, S. 662
Atherton, G. H. 664
Attwood, B. W. 688
Baird, P. K. 651
Baker, R. R. 673
Ballou, C. E. 700
Battista, O. A. 656
Baum, M. 695
Bell, G. E. 650
Bennett, C. E. ..... P 707
Bergstein, F. D. ..... P 705
Bergström, H. O. V. ..... P 704
Bergstrom, N. H. 680
Besley, L. 700
The Bettendorf Company ..... P 712
Bevenue, A. 658
Bhat, R. V. 654, 665
Birtles, R. H. 675
Bloomer, H. C. ..... P 708
Bloomer Bros. Company .... P 708, P 709
Borck, A. J. ..... P 714
Bosshard, A. ..... P 707
Boxboard Containers 652
Boyce, E. G. 652
Bradford, E. A. 689
Bradshaw, W. H. ..... P 717
Brandberg, E. T. 699
Braznell, J. C. 687
Brecht, W. 671
Brinker, H. C. ..... P 715
Broman, L. 688
Brombacher, W. G. 666
Bruun, T. 700
Bruxelles, G. N. 660
Buchwald, E. 680
Budd, L. J. ..... P 705
Buttery, K. T. ..... P 711
Callow, H. J. 667
Camp, T. P. ..... P 705
Campbell, W. G. 665
Canada Paper Company ..... P 708
Canadian Gypsum Company Limited. P 705
Canadian Industries Limited 696
Canadian International Paper Company ..... P 711
Canadian Pulp and Paper Association. *Technical Section. Waste Committee* 696
Canadian Pulp and Paper Industry 663, 666, 680, 691
Carsey, E. A. 703
Chalmers, J. W. ..... P 712
The Champion Paper and Fibre Company ..... P 711
Chase, C. B. ..... P 711
Chester, C. A. 684
Churchman, J. W. 663
Clark, F. M. 660
Clarke, H. E. ..... P 711
Clarvoe, G. W. ..... P 718
Cohen, W. E. 684
Colgren, C. T. ..... P 714
The Commonwealth Engineering Company of Ohio ..... P 716
Connal, J. M. 673
Coomber, H. E. 665
Coon, H. R., Sr. ..... P 712, P 713
Corder, S. E. 664
Couture, J. W. 673
Cox, L. A. 656
Croco, C. P. 673
Crown Zellerbach Corporation 696
Currier, H. N. 649
Dadswell, H. E. 662
Day, F. T. 649, 673, 677, 687
DeCroes, G. C. 685
Deloro Smelting and Refining Company 669
Dick, F. A. 687
Dilts Machine Works 676
Dobrow, M. C. 678
Dorst, W. ..... P 719
Douglas, H. R. 649
Draper, A. J. M. 661
Dulmage, W. G. 699
Dunn, C. G. 703
du Pont de Nemours, E. I., & Company ..... 654, P 717
Durisol Inc. ..... P 707
Ekwall, P. 681
Elliott, N. J. 653
Elmendorf, A. 651
Empire Box Corporation ..... P 710
Engel, E. W. ..... P 715
Enso-Gutzeit Osakeyhtiö ..... P 705
Falk, R. 675
Farmer, R. H. 665
Farrell, R. A. ..... P 709
Ferguson, K. C. ..... P 705
Ferraro, J. V. ..... P 710
Fickler, H.-H. 653
Fiedler, H. 688
Flintkote Company 687
Foote, R. W. 674
Fortunato, V. ..... P 705

Foster, D. H. 684
Fourness, C. A. ..... P 706
Fra. 691
Fram Corporation ..... P 711
Frey, W. 658
Fuerst, E. W. ..... P 706
Gantt, E. S. 652
Garcia, C. 701
Garte, H. 682
General Box Company 692
General Electric Company ..... P 716
General Mills, Inc. ..... P 710
Gerhart, H. L. ..... P 717
Gilbert, C. L. ..... P 706
Giolito, E. J. ..... P 715
Glaser, R. F. ..... P 715
Glassman, J. A. ..... P 706
Godlove, I. H. 659
Gran, G. 657
Great Lakes Box Company 671
Gretz, J. L. 692
Grout, R. G. 691
Guha, S. R. D. 664
Gusler, D. L. 703
Gustafsson, C. 677
Guyer, R. ..... P 709
Gwoosh, S. J. ..... P 708
Hägglund, E. 695
Haller, J. F. ..... P 707
Halvorsen, G. G. 700
Hammond, R. N. 702
Hammond Bag & Paper Company .. P 713
Hansen, O. 699
Hansman, J. F. ..... P 715
Henderson, P. I. ..... P 708
Hendrick, W. T. S. ..... P 709
Heymann, R. D. ..... P 713
Heys, R. C. 671
Hill, R. P. 660
Hock, C. W. 654
Hodge, E. T. ..... P 708
Hohl, G. I. ..... P 712
Homma, K. 695
Hough, L. 665
Houldsworth, W. M. ..... P 708
Hubbard, E. R. ..... P 711
Hyttinen, A. 702
Ilner, P. R. ..... P 711
Imset, O. ..... P 709
Industrial Tape Corporation ..... P 715
Infilco Incorporated ..... P 721
Inland Container Corporation ..... P 705
Inman, W. H. ..... P 709
International Cellucotton Products Company ..... P 706
International Paper Company 683
Irving Pulp and Paper Ltd. 694
Isenberg, I. H. 661
Isotope Developments Limited 689
Ivers-Lee Company ..... P 712
Jackson, D. R. P. ..... P 712
Jacobson, A. ..... P 709
Jaspal, N. S. 654
Jayme, G. 659
Jelks, J. W. 663
Jenness, L. G. ..... P 719
Jensen, W. 650
Joa, C. G. ..... P 710
Johns-Manville Corporation ..... P 718
Johnstone, H. F. 696
Jones, J. K. N. 665
Jullander, I. 655
Jurisch, M. J. ..... P 715
Kahn, J. M. ..... P 721
Kaijser, C. 702
Keller, K. H. ..... P 718
Keyes Fibre Company ..... P 714
Kilham, P. ..... P 707
Kingsbury, R. M. 689
Klimpke, K. 670
Knott, R. B. 660
Konow, R. v. 655
Kottmann, A. A. ..... P 712
Kovec, J. 677
The Kraft Foods Company 671, 675
Kuhn, W. H. 703
L. E. 682
Laaksonen, J. 670
Lander, J. G. 652
Lange, P. W. 662
Langsaeter, A. 664
Lansing, E. S. ..... P 713
Lapp, C. L. 691
Lawrence, R. V. ..... P 719
Lennon, J. W. ..... P 714
Leopold, B. 668
Leslie, R. T. 684
Liebert, E. 683
Limerick, J. M. ..... P 704
Lindgren, R. M. 702
Lovin, R. 695
Lynch Package Machinery Corporation ..... P 712, P 713
Lyons, J., & Company Limited ..... P 709
M.P.J. Gauge and Tool Company, Ltd. 672
Macauley, D. 693
McCarthy, J. F. ..... P 720
McDiarmid, J. S. 663
MacDonald, A. G. 664
McGarry, J. A. ..... P 715
McGovern, J. N. 702
McKeachie, J. G. 686
Macmillan, W. G. 657
McNealy, R. W. ..... P 706
Magnani, A. ..... P 710
Maloney, J. W. 674
Manley, L. 678
Marathon Corporation ..... P 709
Mardon, J. 692
Markle, L. E. 670
Marshall, H. B. ..... P 720
Martin, J. S. 702
Martin, P. E. 650
Mason-Neilan Regulator Company ... 673
Mathieson Chemical Corporation .... P 707
Maudlin, C. V. 698
Maxson Automatic Machinery Company 671
Meaker, J. W. ..... P 719
Meller, A. 661
Mertz, F. A. ..... P 704
Middleton, C. W. ..... P 706
The Miller Company ..... P 718
Minnesota Mining & Manufacturing Company ..... P 715
Mitchell, E. R. 697
Mo och Domsjö Aktiebolag ..... P 717
Moggio, W. A. 694
Molins Machine Company, Limited .. P 712
Morey, C. L. 664
Morley, P. M. 701
Morris, V. N. ..... P 715
Morris Paper Mills ..... P 705
Mortenson, A. O. 669
Moyer, A. E. 699
Müller, E. 671
Munising Paper Company 682
Murphy, E. A. 666
Myers, D. M. 693
Myers, H. L. ..... P 706
Myers, W. J. 700
Nelson, F. 676
Nemerow, N. L. 694
Neubrech, W. L. 678
Nilsson, N. E. ..... P 720
Nitchie, C. D. 652
Nolan, L. S. ..... P 706

Nordman, L. 677
Norta, T. ..... P 705
The Okonite-Callender Cable Company, Inc. ..... P 707
Olofsson, G. 677
The Ontario Paper Company Limited. P 720
Organisation for European Economic Co-operation 678
Ottersland, P. N. ..... P 713
Overbaeck, W. 683
Owen, T., & Co. (Australia) Ltd. .. 681
Owens-Illinois Glass Company ..... P 706, P 715, P 718
Paine, F. A. 692
Pallet Devices, Inc. ..... P 705
Palmer, W. C. ..... P 712
Paper Industry 681
Paper Mill News 674, 679
Parker, L. T. 680
Pedder, D. 692
Percival, E. G. V. 700
Peteri, R. 665
Pike, G. H. 668
Pirie, G. W. 688
Pittsburgh Plate Glass Company ... P 718
Poor, E. N. 689
Popp, R. 679
Power Jets 670
Prebish, R. 668
Prince, G. H. 663
Printing, Packaging and Allied Trades Research Association 653
Processing Equipment Corporation... P 712
Pulp & Paper 680, 681
Rainio, P. 650
Rånby, B. G. 655
Rapp, E. J. ..... P 712, P 713
Rigabar, N. ..... P 713
Rinse, J. ..... P 719
Rist, G. A. ..... P 712
Rist, J. M. ..... P 712
Rittenhouse, R. C. 701
Rocca, J. P. ..... P 716
Rochester, D. M. 680
Rohm & Haas Company 699
Rooksby, W. H. ..... P 711
Rosen, E. 701
Rosner, C. 682
Roy, A. 657
Royalite Oil Company, Limited 697
Rudolfs, W. 694
Runkel, R. O. H. 666
Ryberg, N. ..... P 711
Rys, L. 683
St. Clair, W. E. ..... P 719
St. Regis Paper Company ..... P 716
Salfisberg, L. L. ..... P 712
Salvesen, J. R. 695
Samuelson, H. O. ..... P 717
Sankey, C. A. ..... P 720
Schaffrath, P. M. 658
Schenk, H. F. ..... P 713
Schmitz, W. R., Jr. ..... P 717
Schneider, H. G. ..... P 716
Schnell, A. ..... P 707
Schoener, J. G., Jr. 690
Schröter, H. 684
Schwalenstöcker, H. 658
Schwartz, S. L. 651
Schwertfeger, W. J. ..... P 714
Scott, H. R. 663
Sen Gupta, A. B. 657
Shankweiler, F. K. 660
Shaw, A. C. 701
Shearon, W. H., Jr. 662
Shellmar Products Corporation ..... P 714
Shirley, F. J. ..... P 707
Simmonds, F. A. 689
Simmons, R. H. 687
Simpson, G. G. 661
Singh, C. 664
Sivola, Y. ..... P 705
Sixt, K. ..... P 709
Smith, A. E. ..... P 716
Smith, H. P., Paper Company 676
Smith, R. S. ..... P 720
Society of Plastics Industry, Inc. ... 698
Sorenson, H. A. 695
Soughton, F. O. 691
Spalding, R. O. ..... P 718
Spence, W. 669
Spencer, A. M. ..... P 709
Spiwak, L. 699
The Spooner Dryer and Engineering Company, Ltd. 670
Standard Oil Development Company. P 716
"Stenson." 698
Stephansen, E. ..... P 709
Stephanus, H. ..... P 719
Stevenson, L. T. 679
Stewart, C. M. 684
Stockman, L. 695
Studd, F. T. 676
Sutherland, D. G. ..... P 718
Sutherland, D. M. ..... P 718
Sutherland, L. M. ..... P 718
Sutherland Paper Company .. P 711, P 714
Suzuki, H. 674
Swartz, J. N. ..... P 708
Sylvester, R. O. 694
Tachikawa, S. ..... P 717
Tamblyn, J. W. 685
Taylor, C. E. ..... P 708
Taylor Refiner Company, Inc. ..... P 713
Tengquist, E. 690
Terrell, B. Z. 697
Thayer, G. B 685
Thompson, H. H. ..... P 716
Tokiwa, Y. 695
Tomlinson, G. H. ..... P 708
Tomlinson, G. H., II 649
Toulmin, H. A., Jr. ..... P 716
Traylor Engineering and Manufacturing Company ..... P 704
Treesdale Laboratories and Textile Processing Company ..... P 720
The Trendex Co. ..... P 719
Trist, A. R. ..... P 714
Trobeck, K. G. ..... P 704
Turners Asbestos Cement Company Limited ..... P 711
U. S. Secretary of Agriculture ..... P 719
Valtasaari, L. 658
Van den Akker, J. A. 649
von Hildebrandt, P. G. ..... P 710
Wadman, W. H. 665
Waldorf Paper Products Company.. P 709
Walker, R. S. ..... P 704
Wandel, K. ..... P 712
Wangaard, F. F. 666
Wardrop, A. B. 662
Watson, A. J. 684
Weaver, A. E. ..... P 713
Weavewood, Inc. ..... P 716
Weiblen, J. W. 663
Weidner, C. L. ..... P 715
Weise, F. H. ..... P 712
Weldon, G. B. 683
West Virginia Pulp & Paper Company ..... P 720
Westerberg, M. O. 686
Wetlesen, C. U. 657
Wexler, A. 666
Wheeler, G. E. 666
Whitlock, W. R. ..... P 704
Whitney, R. E. 660
Willcox, O. B. ..... P 717
Williams, A. E. 650, 673

Williams, A. F. 659
Williams, K. T. 658
Wise, L. E. 701
Witthoft, H. C. ..... P 716
Wolman, A. 698
Wörner, G. 659
Yorke, N. R. ..... P 716
Young, D. W. ..... P 716
Young, J. H. 656
Zwicker, B. M. G. 667

The Institute of Paper Chemistry has entered into an agreement with University Microfilms, Ann Arbor, Michigan, whereby University Microfilms is authorized to provide microfilm copies of this Bulletin to subscribers. To the extent that back issues were in print at the date of execution of the agreement, microfilm copies of these back issues can also be obtained. Sales by University Microfilms of films of this Bulletin are restricted to regular subscribers to the Bulletin. The microfilm is distributed only at the end of the volume year. The film is in the form of positive microfilm, and is furnished on metal reels, suitably labeled. Inquiries concerning purchase should be directed to:

University Microfilms
313 North First Street
Ann Arbor, Michigan

LIBRARY SERVICE

The Library of The Institute of Paper Chemistry is located in the Kimberly Memorial Building. Its purpose is to serve the students and the faculty of The Institute of Paper Chemistry and the chemists and technologists of the pulp and paper industry.

To contributing members it gives the following service:

A monthly bulletin is issued, listing all new books and periodicals added to the library and containing titles and abstracts of articles published during the previous month in the field of pulp and paper chemistry and technology. The annual index carries a list of periodicals currently received.

At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats, or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

During the summer months until the first of September, the library will be open Monday through Friday from 8:00 to 5:00. It will be closed on Saturday and Sunday.